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**BIOMEDICAL AND BEHAVIORAL SCIENCES**

**No. 5**



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24 November 1980

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LIFE SCIENCES  
BIOMEDICAL AND BEHAVIORAL SCIENCES

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ADVANCED BIOTECHNOLOGY

UDC 577.3+535.217

NONLINEAR LASER PHOTOMODIFICATION OF MACROMOLECULES: DNA CLEAVAGE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 250, No 1, 1980 pp 225-229

PARKHOMENKO, A. I., RAUTIAN, S. G., corresponding member of the USSR Academy of Sciences, and SHITOKMAN, M. I., Institute of Automation and Electrometry, Siberian Branch, USSR Academy of Sciences, Novosibirsk

[Abstract] In view of the need for a technique for introducing radiation damage to macromolecules that is limited in size and in the number of chemical bonds that are involved, theoretical considerations and experimental data are provided for the use of 337 nm nitrogen laser light in cleaving 8-methoxypsoralene labeled DNA. The dye is understood to absorb two quanta of light and is excited to a higher singlet state with an energy of six or seven electron volts. The subsequent nonradiant transfer of energy to the macromolecule results in the dye returning to its basic state and may again serve to induce photomodification of the macromolecule around it. The resultant process may be referred to as a 'biquantal affinity modification.' Exposing labeled and unlabeled phage T7<sup>+</sup> DNA to focused (ca. Mwatts/cm<sup>2</sup>) and unfocused (ca. 0.1 Mwatts/cm<sup>2</sup>) laser light for different periods of time led to cleavage by the focused light of single-stranded DNA on the basis of hyperchromic (at 256 nm) and gel electrophoretic criteria. The number of breaks in the single stranded DNA by the nonlinear method exceeded three-fold that seen in linear damage with 254 nm light. Figures 4; references 4: 2 Russian, 2 Western.

[198-12172]

UDC 576.851.48.098.396

NEW F-LIKE GENETIC TRANSFER FACTOR, pAP38, AND ITS COMPATIBILITY WITH PLASMIDS OF F-GROUP INCOMPATIBILITY

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 251, No 5, 1980 pp 1260-1263  
manuscript received 6 Dec 79

PEKHOV, A. P., SHCHIPKOV, V. P., RESHETNIKOVA, V. N., DROBYSHEVA, N. A. and GUBAR', Ye. V., University of Peoples Friendship imeni Patrice Lumumba, Moscow

[Abstract] The genetic transfer factor, pAP38, was earlier found by the author in cells of *E. coli* AP15 strain (serogroup O106). This F-like plasmid factor can be transferred from some bacteria to others and can be mobilized for transport of non-conjugated plasmids. F-like plasmids discovered by other investigators differ in

compatibility when introduced into the same bacterial cell. The present work was done to establish whether pAP38 belonged to one or another F-group of incompatibility, of which groups six are currently known (F1 to FVI; Novic, et al, 1976; Monte-Bragadin, et al, 1975). Genetic marking of the factor employed transposon Tnl which has a gene which controls resistance to ampicillin. Tests to determine the affiliation of pAP38::Tnl to an F-group of incompatibility involved introduction of the factor, using conjugation-crossing, into cell recipients which had--as a plasmid resident--one of the plasmids, the reference plasmid, from each of the six groups of incompatibility; reversely, a reference-plasmid of each group of incompatibility was introduced into cells containing--as plasmid resident-- the studied factor of transfer. Standard procedures of crossing were employed. In all of the tests, surface rejection of the introduced plasmids by the plasmid residents was not observed, or occurred to an insignificant degree. Cells of all, or of an absolute majority of the colony-transconjugants contained two each plasmids--transfer factor and one of the reference plasmids of each F-group of incompatibility. No elimination of plasmids occurred in the controls. Clonal tests of stability showed that the coexistence of the pAP38::Tnl factor with each reference-plasmid of each F-group of incompatibility is exceptionally stable; the pAP38::Tnl factor is compatible with F-plasmids of all groups of incompatibility. The data are taken to indicate that bacteria of natural populations can contain factors of genetic transfer which, despite their F-like quality, differ from each other on the genetically-determining property of incompatibility. References 10: 3 Russian, 7 Western.

[348-8586]

UDC 575.1.113+576.851.1

#### pBS4--A NEW PLASMID INVOLVED IN NAPHTHALENE BIODEGRADATION

MOSCOW DOKLADY AKADEMII NAUK SSSR in Russian Vol 250, No 1, 1980 pp 212-215

SKRYABIN, G. K., Academician, KOCHETKOV, V. V., YEREMIN, A. A., PEREBITYUK, STAROVYOTOV, I. I., and BORONIN, A. M., Institute of Microbial Biochemistry and Physiology, USSR Academy of Sciences, Pushchino

[Abstract] Studies were conducted on the genetic aspects of naphthalene catabolism via gentisic acid in *Pseudomonas* species which led to the isolation of a 115 megadalton plasmid DNA from *Ps. fluorescens* BS291. Transformation studies were successful only with *Ps. putida* PpG1 (CAM) met with a frequency of  $5 \times 10^{-7}$ ; the resultant transformed cells acquired the ability to grow on naphthalene as the sole carbon source ( $\text{Nah}^+$ ). The new plasmid was designated as pBS4. In addition, while *Ps. fluorescens* BS291 (pBS4) was unable to transmit the  $\text{Nah}^+$  trait by conjugation to recipient, *Ps. PpG1* (CAM, pBS4) transferred the pBS4 plasmid (and CAM) during conjugation with a frequency of  $10^{-7}$  to  $10^{-8}$ . Further plasmid compatibility investigations resulted in pBS4 being assigned to the P-7 incompatibility group. Tables 3; figures 3; references 15: 6 Russian, 9 Western.

[198-12172]

UDC 547.964.4.07

NATURAL PEPTIDES AND THEIR ANALOGS. XXIII. SYNTHESIS OF SOMATOSTATIN WITH UNBLOCKED HYDROXYL GROUPS ON THE HYDROXYAMINO ACID MOIETIES

Moscow BIOORGANICHESKAYA KHIMIYA in Russian No 2, 1980 pp 187-196

SHVACHKIN, Yu. P., CIRIN, S. K., SMIRNOVA, A. P., SHISHKINA, A. A., and YERMAK, N. M., Institute of Experimental Endocrinology and Hormone Chemistry, USSR Academy of Medical Sciences, Moscow

[Abstract] Details are provided for the complete chemical synthesis of the tetradecapeptide somatostatin. The essentially standard procedures incorporated two innovations: 1) the use of hydroxyamino acids with unblocked hydroxyl groups (thr<sup>10</sup>, thr<sup>12</sup>, ser<sup>13</sup>), and 2) the use of tetrahydropyranyl groups for blocking the SH groups on cys<sup>3</sup> and cys<sup>14</sup> in the intermediate steps. Following stepwise synthesis of several fragments (1-3, 4-7, 8-12), the final synthetic step consisted of amide condensation of two heptapeptides (1-7 and 8-14) and the subsequent separation of the somatostatin molecule from the reaction mixture by chromatography on a C-25 column in a n-butanol:acetic acid:water (4:1:5) system. The product was obtained in an analytically pure state and possessed biological activity. Tables 1; references 16: 7 Russian, 9 Western.  
[263-12172]

UDC 5 76.838.6

INDIGENOUS VIRUSES AND THEIR BIOLOGICAL ROLE

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 2, 1980 pp 129-137  
manuscript received 20 Nov 79

KUKAYN, R. A., MUROVSKA, M. F. and SVIRSKA, R. V., Institute of Microbiology imeni Avgust Kirkhenshteyn of the Latvian SSR Academy of Sciences

[Abstract] Experimental data show that a normal cell can produce viruses which have all the features of retroviruses while being normal products of a normal cell. Both indigenous and exogenous viruses are divided into types A, B and C by morphological features, relationship of the membrane to the internal nucleotide and the method of formation. Three classes of indigenous viruses--exotropic, xenotropic and amphotropic--have been identified in a range of hosts. Broad circulation under natural conditions among vertebrates and fowl and universal distribution not only in germinal but in somatic cells as well are typical features of indigenous viruses. The functions that indigenous viruses play in the organism have not been determined despite the considerable amount of experimental material accumulated. Infection by an exogenous virus has no effect on expression of individual genes of indigenous viruses. It is important that the presence of indigenous viruses in the cell may block integration and even exogenous infection by a similar, but pathogenic oncogenic virus. The role of these viruses in normal vital processes and when they become malignant is also discussed.

[313-6521]

UDC 591.175.05:597.82:598.617

NATURE OF ANTAGONISM BETWEEN SNAKE VENOM ALPHA-TOXINS AND CHEMICAL AGONISTS ON FROG AND CHICK SKELETAL MUSCLES

Leningrad ZHURNAL EVOLYUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian No 1, 1980 pp 47-52

DANILOV, A. P., ZAV'YALOVA, N. Ye., and LAVRENT'YEVA, V. V., Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, USSR Academy of Sciences, Leningrad

[Abstract] Skeletal muscles (rectus abdominis) of the frog *Rana temporaria* and 6-14 day old chicks (m. biventer cervicis) were used to study the effects of acetylcholine (ACh) and carbacholine (CCh) on muscles pretreated with either alpha-bungarotoxin (*Bungarus multicinctus*) or alpha-neurotoxin obtained from the venom of the snake *Naja naja oxiana*. The results demonstrated that when either snake toxin occupied 93-95% of the available cholinoreceptors the dose response curve for ACh and CCh was shifted to the right without a decrease in maximum contractility. A further increase in the number of toxin-occupied receptors resulted in a further shift to the right on the dose-response curves and a decrease in maximum contractility. The shifts were unaffected by inhibition of cholinesterase with organophosphorus inhibitors. These findings indicate a competitive inhibition between ACh or CCh on the one hand, and the alpha-toxins on the other, rather than an allosteric effect of the toxins on the cholinoreceptors. The competitive inhibition technique may be used to determine the affinity constants of ACh and CCh for the receptors, and to uncover the presence of 'reserve' cholinoreceptors on skeletal muscles.

Figures 4; references 25: 6 Russian, 19 Western.

[246-12172]

UDC 577.1 : 534.121.2

THE EFFECT OF TRITERPENE GLYCOSIDES OF MARINE INVERTEBRATES ON THE PERMEABILITY OF NATURAL AND SYNTHETIC MEMBRANES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 3, May/Jun 80 pp 402-407 manuscript received 15 Nov 79

RUBTSOV, B. V., RUZHITSKIY, A. O., and KLEBANOV, G. I., et al, Central Advanced Training Institute for Physicians, Moscow

[Abstract] The mechanism of action of triterpene glycosides (TG): halothurin (HAL) and cucumaraside (CM) on two simple membrane systems: sarcoplasmic reticulum (SR) membranes and liposomes was studied. Comparison of the TG action on sarcoplasmic reticulum containing proteins with lipid membranes would show which specific component is affected by these compounds. In concentrations of  $10^{-5}$  M and higher, both HAL and CM increased the permeability of SR and liposome membranes to  $\text{Ca}^{++}$  ions,

influencing the ATP-ase activity of the SR vesicles. Concentrations below  $10^{-5}$  M led to slightly lower accumulation of  $\text{Ca}^{++}$  ions and lower ATP-ase activity; the ratio of  $\text{Ca}/\text{ATP}$  remained the same. The glycosides studied exhibited three effects: 1) the activity of ATP-ase was lowered starting with the  $10^{-7}$  M concentration, 2) the permeability of SR membranes was increased at  $10^{-5}$  M concentration with separation of the calcium transport from the ATP-ase activity and 3) at concentrations above  $10^{-5}$  M an increased permeability of the lipid layer to  $\text{Ca}^{++}$  was seen. Figures 3; references 24: 4 Russian, 20 Western.  
[385-7813]

UDC 599.533

POSTNATAL BEHAVIOR PATTERN OF BOTTLENOSE DOLPHIN OFFSPRING DURING THE BREEDING PERIOD: IMITATION REACTIONS IN CETACEANS

Moscow BYULLETEN' MOSKOVSKOGO OBRASHCHESTVA ISPYTATELEY PRIRODY in Russian Vol 84, No 5, Sep/Oct 79 pp 35-40

TOMILIN, A. G. and BLIZNYUK, Ya. I.

[Abstract] A detailed description of the first postnatal moments in the life of a dolphin was given, followed by activities of the mother and a "midwife" in helping the offspring to learn the functions of breathing, swimming and feeding. The death of five newborn dolphins is described in detail, stressing the behavior of the mother. The imitation reaction of the offspring is most pronounced during the first few days when the mother-child relationship is very close. At about the fourth month, a young dolphin's behavior resembles that of an adult animal. The most important acts of dolphins in their adaptation to water include the surfacing reflexes, milk feeding method, the imitation reactions, escorting the newborn dolphins by the mother and the "midwife," and the emergence of controlled, rigid fins on the tail, the back and on the chest. References 17: 10 Russian, 7 Western.  
[77-7813]

CORTICAL PROJECTIONS OF THE MEDIAL GENICULATE BODY OF A DOLPHIN BRAIN

Leningrad ARKHIV ANATOMII, CISTOLOGII I EMBRIOLOGII in Russian No 4, 1980 pp 19-24  
manuscript received 20 Jun 79

KRASNOSHCHERKOVA, Ye. I., and FIGURINA, I. I., The Laboratory of Ecological Physiology of the A. A. Ukhtomskiy Scientific Research Institute for Physiology of the A. A. Zhdanov Leningrad State University

(Abstract) Two *Phocaena phocaena* dolphins were anesthetized with novocain and unilateral electrocoagulation administered at a constant current of 10 mA for 60 seconds to the medial geniculate body. A control dolphin had an electrode implanted without the administration of electrocoagulation. After 10 days the dolphins were sacrificed, the brains removed and preserved in Formalin, and then treated with eeacharose and sections impregnated by the Fink-Heimer method. Microscopic analysis showed the breakdown of small portions of the dorsal and ventral sections of the microcellular nucleus. There was degeneration of fibers and terminals in various parts of the cortex, with variations depending on the precise locations of fibers. Analysis showed that in the parietal-occipital and temporal areas thalamic auditory afferent fibers terminate in a specific agranular type, while in the occipital area they are of a nonspecific type. Figures 6; references 18: 12 Russian, 6 English. [395-12131]

## ADVANCED MEDICAL TECHNOLOGY

### ACHIEVEMENTS OF INSTITUTE OF HUMAN MORPHOLOGY DISCUSSED

Moscow MEDITSINSKAYA GAZETA in Russian 26 Oct 79 p 3

[Article by L. Bykova, candidate of biological sciences: "In the Interest of Man"]

[Text] The Institute of Human Morphology of the USSR Academy of Medical Sciences headed by A. P. Avtayn, academician of the USSR Academy of Medical Sciences, was organized in 1961. The study of the structure of the human body in health, disease and individual development is its basic problem. Investigations are conducted at organism, organ, tissue and cell levels and are of great practical, not only theoretical, importance.

This article discusses the work of several laboratories at the institute directly connected with medicine.

We say "be well!" when we greet our friends. We say "be in good health!" when we take our leave. It is easy to wish someone health, but not so easy to preserve it, especially if one moves to geographical latitudes with harsh natural conditions and a period of adaptation to them begins. The laboratory of geographical pathology headed by Doctor of Medical Sciences A. A. Zhavoronkov seeks an answer to the question as to what should be done so that adaptation may be very painless. Investigation of the changes in the adaptation of the human organism and development of recommendations for the prevention and treatment of diseases connected with extreme conditions are the basic aspects of its work. Annual overall expeditions, in which biologists and physicians in various specialties participate, study the manifestations of adaptation and nonadaptation in new settlers and compare the data on the functions and structure of respiratory and circulatory organs obtained in them with the corresponding indicators among the native population. A change in the functional systems of the organism under the conditions of the Far North follows the patterns of adaptation to hypoxia, even if the atmospheric pressure does not change significantly. The oxygen regimen of new settlers in arctic and subarctic regions changes and shortness of breath appears even with a light physical load. This is accompanied by a structural change in the respiratory system.

What are the ways of increasing man's adaptability? First of all, physical training. A. P. Avtayn, academician of the USSR Academy of Medical Sciences, believes that preliminary training under upland conditions can increase the adaptation capabilities of the organism. The second way is medication. Ascorbic acid and a tincture of centaury (zolotoy koren') and ginseng can increase the tone of the organism and facilitate adaptation.

Experimental models of diseases are also created in this laboratory. In particular, diseases of a biogeochemical nature, which are connected with an increased or lowered concentration of macro- and microelements in the environment, are studied.

The pathogenesis of infectious diseases is also studied at the institute. The laboratory of cell pathology and electron microscopy under Prof V. A. Shakhlamov's guidance developed an experimental model of cholera intoxication and proposed a new secretion and filtration theory of this disease. Intimate mechanisms of another serious disease--amyloidosis--are also studied here by means of electron microscopy. The close relationship between this laboratory and the clinics where heart surgery is performed enabled pathologists to propose an interesting quick method of predicting the possible outcome of an operation. It can serve as a reliable aid for physicians when treating patients with cardiovascular disorders.

Hypertension is one of the most widespread vascular diseases of our time. In the laboratory of pathophysiology under the guidance of Prof S. V. Andreyev, RSFSR honored scientist, scientists studied the mechanisms of development of this disease for several years. As a result, an enzyme preparation lowering pressure for a long time and preventing hypertension crises--increpan--was obtained.

The approval of an original thrombolytic preparation--terrilitin--obtained from a mold fungus at the Institute of Microbiology of the USSR Academy of Sciences is another important achievement of the laboratory. The preparation quickly dissolves blood clots. For an investigation of its thrombolytic properties various models of experimental thrombosis were created in the laboratory. Removal of the external layer of a vessel, partial destruction of its internal layer synthesizing anticoagulants and damage to the nerve structures embedded in the walls of a vessel--this is a mechanical model of thrombosis. Thrombogenesis produced in this way can be seen well on an X-ray picture.

The creation of another model--thrombosis of the vessels of the lesser circulatory system--was generated by a need to control the thromboembolism of lung vessels. After all, in patients suffering from thrombosis, even when they shake slightly during coughing or sneezing, thrombi can break off and with the flow of blood fall into lung vessels, whose obstruction causes a quick death.

What is to be done with diseases, the responsibility for which rests with inherited defective genes? After all, there are many such genes in the human organism. Prof B. B. Puke, head of the laboratory of cytochemistry and molecular biology of immunogenetics, told us about the results of study of one of such diseases--hereditary dystrophy of the retina. In such patients orientation in the twilight is disturbed, visual acuity drops rapidly and blindness occurs by the age of 17 or 20. Apparently, the pathological process begins in the cells of rod photoreceptors responsible for twilight vision. The assumption that the damaged gene controls the exchange of nucleotides of these structures made scientists search for replacement therapy. As a result, a new preparation--encad--containing a set of certain ribonucleotides was developed. During the treatment of peripheral forms of hereditary dystrophy of the retina encad expands the field of vision, improves the state of photoreceptors and increases visual acuity. A positive effect is observed in

46 to 50 percent of the patients and with repeated courses is preserved for a long time. Although the mechanism of action of encaid is not yet completely clear, scientists assume that it can compensate for the shortage of nucleotides in the affected retina in some forms of hereditary dystrophy.

For a number of years this laboratory together with the Institute of Medical and Biological Problems has also been studying problems of space immunology. The established deviations in immunity under space flight conditions are determined according to the number and functional properties of lymphocytes participating in immune reactions. Much attention is given to the study of the structure and properties of antigen recognizing receptors of T- and B-lymphocytes--main immunity cells.

The existence in the blood of some women of antibodies directed against the antigens of spermatozoa is one of the unclarified paradoxes of nature. A group for the immunology of human reproduction guided by Doctor of Medical Sciences M. Sh. Verbitskly is engaged in the study of the immunological aspects of infertility. In our country infertile marriages comprise 10 to 15 percent. At first the existence in women's blood of spermagglutinins--substances capable of agglutinating spermatozoa--was considered the basic factor in infertility. Later, however, it was disclosed that such antibodies to sperm antigens are found in the blood of both women suffering from infertility and of pregnant women. Subsequently, scientists noted that in case of infertility of undetermined origin sperm immobilizers capable of immobilizing spermatozoa are found in the blood of women. It turned out that their presence is of greater diagnostic importance than the existence of spermagglutinins. Sperm immobilizers were not found in the blood of girls and pregnant women. A heightened sensitivity of the female organism to the antigens of spermatozoa can arise against the background of organic disturbances of the reproductive sphere. In such cases in the treatment of infertility, along with the elimination of the basic causes (for example, obstruction of the uterine tubes), desensitizing therapy should be carried out to suppress the immune reactions of the female organism to sperm antigens.

As experiments and vast clinical data have shown, the autoimmune reaction of the female organism to the autoantigens of the transparent zone of the ovum proper also plays a role in the development of infertility. This phenomenon can also be utilized in the search for a safe immunological method of contraception. The study of the role of cellular immunity factors in the development of infertility will help to develop effective therapeutic and preventive methods. During this Year of the Child these investigations acquire special importance.  
[570-11,439]

11,439  
CBO: 1840

UDC 576.858.25.095.383

HIGH INTERFERON INDUCTION BY OKHOTSKY ORBIVIRUS IN LYMPHOID CELLS

Moscow VOPROSY VIRUSOLOGII in Russian No 1, 1980 pp 79-81

NOVOKHATSKIY, A. S., LARZO, S. S., SARKISYAN, B. G., TSAREVA, A. A., BEREZINA, L. K., and L'VOV, D. K., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Strain LEIV-287 of the Okhotsky orbivirus was tested for interferon induction in continuous human lymphoblastoid lines Raji and Namalva derived from Burkitt's lymphoma, in view of the fact that the genome of the virus consists of double-stranded RNA. The Okhotsky virus was found to be about equivalent to the Newcastle Disease virus in the induction of interferon, but about four to eight times as effective as poly-IC in terms of interferon titers. In addition, titers on the Namalva line were about twice as high as on the Raji line under the conditions employed. Exposure to the Okhotsky virus decreased the number of viable Namalva cells two-fold after 24 h, but increased that of the Raji cells 1.5-fold in comparison with uninfected control cells. Tables 3; references 5: 1 Russian, 4 Western.

1296-12172

UDC 626-092:577.156.3

EFFECTS OF SQ-20881, AN INHIBITOR OF CARBOXYCATHEPSIN (ANGIOTENSIN I TRANSFORMING ENZYME), ON PERIPHERAL CIRCULATION IN THE IMMEDIATE POST-RESUSCITATION PERIOD

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 250, No 1, 1980 pp 253-256

GREKHOVICH, V. N., full member of the USSR Academy of Medical Sciences (PMAMS), YELISEYEVA, Yu. Ye., PAVLIKHINA, L. V., NEGOVSKIY, V. A., PMAMS, NOVODERZHINA, I. S., and MOLCHANOV, L. V., Institute of Biological and Medical Chemistry, USSR Academy of Medical Sciences, and the Scientific Research Laboratory of Resuscitation, USSR Academy of Sciences, Moscow

[Abstract] Studies were conducted on the efficacy of intravenous administration of SQ-20881, a nonapeptide (pyr-try-pro-arg-pro-gly-ile-pro-pro) inhibiting carboxycathepsin, in the recovery of dogs subjected to cardiac arrest by electrically induced ventricular fibrillation. Intravenous drip of SQ-20881 (1.5 mg/kg body weight) was commenced 4-5 min from the start of resuscitation after a 17 min period of clinical death and continued for up to 2.5 h. The results showed that animals administered SQ-20881 (in conjunction with rheopolyglucine to maintain blood volume) evidence marked peripheral vasodilatation, resulting in a 100% increased blood flow as measured in the extremities, as well as 100% survival without neurologic sequelae. Animals treated with rheopolyglucine alone had a survival rate of 70% and

presented with evidence of CNS damage. The efficacy of SQ-20881 was ascribed to its inhibition of carboxycathepsin which also inactivates bradykinin—present in the plasma and vascular endothelium, particularly in the brain. The presumed retention of circulatory bradykinin led to vasodilation and greater cerebral oxygenation which is of prime importance in resuscitative measures. Tables 1; figures 1; references 15: 6 Russian, 9 Western.

[198-12172]

UDC 615.874.2:547.466]:615.456.03

EXPERIMENTAL AND CLINICAL ASPECTS OF PARENTERAL NUTRITION AND THE USE OF A NOVEL SOVIET AMINO ACID PREPARATION 'POLIAMIN'

Moscow VESTNIK AKADEMII MEDITSINSKIH NAUK SSSR in Russian No 2, 1980 pp 59-64

VASIL'YEV, P. S., KLIMANSKIY, V. A., SUZDALEVA, V. V., DEMIDOVA, N. V., ZAGREKOV, I. A., GOLOVASTOVA, G. I., ROGACHEVA, L. S., AKSENOVA, O. V., and SHCHERBAKOVA, G. N., Central Scientific Research Institute of Hematology and Blood Transfusion, USSR Ministry of Health, Moscow

[Abstract] A review is presented of clinical and experimental findings on the rationale and effectiveness of parenteral nutrition, with particular attention accorded to experience with a new Soviet amino acid preparation designated 'Poliamin' (polyamine). While such preparations are of unquestionable clinical usefulness in malnutrition, debility, pre-, intra-, and post-operative care, there yet remain significant problems with monitoring the nutritional state of such patients and the efficacy of the parenteral nutrients, assuring long-term delivery via the intravenous route, and in providing adequate energy sources and potentiation of anabolism. The therapeutic efficacy of Poliamin has been greatly extended by combining it with energy sources consisting of 30% glucose solution and fat emulsions. Figures 3; references 2: 1 Russian, 1 Western.

[297-12172]

UDC 615.332 (Amphoglucominum).015.46

EFFECT OF SOVIET AMPHOGLUCAMINE ON SOME PARAMETERS OF HUMORAL IMMUNITY

Moscow ANTIBIOTIKI in Russian No 1, 1980 pp 32-35 manuscript received 27 Apr 79

MIKHAYLOVA, M. A., and EKZEMPLYAROV, O. N., All-Union Scientific Research Technological Institute of Antibiotics and Enzymes for Medical Purposes, Leningrad

[Abstract] Experiments were conducted on male rabbits immunized with Coccidioides immitis 158 vaccine, prepared from a suspension of fungal spores in isotonic sodium chloride, to test the effect of a new Soviet antibiotic, amphoglucomine (N-methyl-d-glucaminic salt of amphotericin B) on humoral immunity indices. Amphoglucomine was given for 10 days before immunization, 10 days concurrently with immunization or after immunization. According to complement titer, arthrosore agglutination and precipitation reactions, the new antibiotic did not have any effect, except for some tendency toward depression of reaction titers. The findings were indicative of inhibition of immunogenic properties of the immune serum and suppression of allergic reactions to antigen. Figures 3; references 3: 2 Russian, 1 Western.

[222-10,657]

UDC 576.852.21.095.35

ARTHROBACTER SIMPLEX VAR. AMYLOLYTICUS VAR. NOV. - PRODUCER OF THE HEXAEN ANTIBIOTIC FROM THE FRADICIN-MYCELIN GROUP

Moscow ANTIBIOTIKI in Russian Vol 25, No 2, Feb 80 pp 83-88 manuscript received 18 Jul 79

KUZNETSOVA, O. S., KRUGLIKOV, L. F., and KONEV, Yu. Ye., et al, All-Union Scientific Technological Research Institute of Antibiotics and Enzymes for Medical Application, Leningrad

[Abstract] In the process of searching for new antifungal antibiotics in Krasnodar region soil samples, a new bacterial culture was isolated: LIA 0953 which by its morphological, cultural and physiological properties was similar to Arthrobacter simplex; however, it had different antibiotic properties and could hydrolyze starch. It was established that the antibiotic complex represented a mixture of nonpolyenic antibiotic and hexaen. This agent has been characterized now in detail. On the basis of this, the new strain was called arthrobacter simplex var. amylolyticus var. nov. Kuznetsova, Konev. The agent had a low activity against yeasts; it suppressed the growth of gram-negative and gram-positive bacteria, fungi and actinomycetes. Using the countercurrent distribution method in n-propanol-ether-water system, it was shown that this hexaen antibiotic had a distribution coefficient close to that of the fradicin-mycelin group of antibiotics. Figures 3; references 24: 4 Russian, 20 Western.

[262-7813]

UDC 576.858.25.01(479.24)

KYZYLAGACH VIRUS: A NEW ARBOVIRUS ISOLATED FROM THE CULEX MODESTUS MOSQUITOES IN AZERBAIJAN SSR

Moscow VOPROSY VIRUSOLOGII in Russian No 5, Sep/Oct 79 pp 519-523

L'VOV, D. K., GROMACHEVSKIY, V. L., SKVORTSOVA, T. M., et al., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Results of the investigation of LEIV 65A virus isolated in 1969 from mosquitoes collected in a colony of ciconiiformes birds in Kyzylagach sanctuary have been reported. On the basis of the antigenic, morphologic and biophysical-biochemical properties, the Kyzylagach virus was assigned to the alpha-virus of the Togaviridae family. The unilateral antigenic relationship of this virus to the Sindbis virus is a new phenomenon, since nothing like this has been observed before. Though similar to Sindbis viruses, the Kyzylagach virus is different, possibly a result of evolutionary adaptation to local conditions. Figures 3; references 12: 3 Russian, 9 Western.

[103-7813]

UDC 615.37:[576.851.46+576.852.23+576.851.551].015.4:616.8-009.24-092.9

ACTIVATION OF THE CONVULSIVE SYNDROME IN MICE AFTER ADMINISTRATION OF ABSORBED DPT VACCINE

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, 1980 pp 73-77 manuscript received 27 Jun 78

KOVAL'SKAYA, S. Ya., OZERETSKOVSKIY, N. A., State Institute for Standardization and Control of Medicinal Biological Preparations imeni L. A. Tarasevich, Moscow

[Abstract] The convulsive syndrome after the administration of absorbed DPT vaccine was studied in mice, using thiosemicarbazide, which is an inhibitor of glutamate-decarboxylase, as the experimental model. Convulsive activity caused by thiosemicarbazide at different periods after administration of the absorbed DPT vaccination showed that death began earlier among the experimental animals than among the control group, beginning 10 days after vaccination. Subsequent tests confirmed the results of the earlier experiments. The induction of convulsions in experimental animals after administration of the absorbed DPT vaccine indicates a relationship to the occurrence of convulsive states in children during the postvaccination period, possibly caused by hereditary neurological disorders. Figures 1; references 13: 3 Russian, 10 Western.

[224-6521]

UDC 616.1-073.4-8

USE OF ULTRASOUND FOR CHARACTERISTICS OF THE STATE OF BLOOD CIRCULATION

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 11, 1979, signed to press  
23 Feb 79, pp 117-128

TSEDERS, E. E., Institute of Polymer Mechanics, Latvian SSR Academy of Sciences

[Abstract] Ultrasound procedures used in determining the state of the blood circulation system were reviewed and analyzed and problems of diagnoses and basic requirements for measurement systems were presented and discussed with some consideration of causes of errors. Systems which ensure control of positioning of the data unit converter and the depiction of the vessel or its cross section in displays and the procurement and presentation of other required data are described in some detail. References 11; Figures 8.

[143-2791]

UDC 577.858:25.077.35

RADIAL HEMOLYSIS TEST WITH ARBOVIRUSES

Moscow VOPROSY VIRUSOLOGII in Russian No 5, Sep/Oct 79 pp 550-553

GAYDAMOVICH, S. Ya. and MEL'NIKOVA, Ye. E., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] An attempt was made to modify the radial hemolysis test (RHT), to make it applicable to the A and B antigenic groups of the arboviruses, since the original Schild method gave negative results. The crucial point in this development concerned the utilization of sensitive erythrocytes, adsorbing the viral antigen on their surface. The modification of the Schild test consisted of the optimization of antigen adsorption conditions by sensitizing goose erythrocytes with hemagglutinating antigens, prepared from virus containing mouse brain cells by sucrose-acetone extraction at a pH optimum for each individual virus. The following viruses were used in the study: Sindbis (strain As-16), Chikungunya (strain Ross), Semliki (strain Zaysan), Japanese encephalitis (strain P-1), West Nile (strain 1628), dengue 1 (strain How) and 2 (strain India 23085). Figures 2; references: 7 Western. [103-7813]

THE RELATIONSHIPS OF FUNGI USED AS TEST CULTURES WITH REGARD TO METHODS OF TESTING THE BIOLOGICAL STABILITY OF MEDICAL PRODUCTS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 3, 1980 pp 58-66 manuscript received 10 Jan 79

TURKOVA, Z. A. and TUTKOVA, O. A., Institute of Medical Instrument Building of the USSR Ministry of the Medical Industry

[Abstract] The relationships in mycocoenoses formed on anthropogenic substrates and in artificial mixtures of cultures during laboratory tests were determined. Fungi isolated from products infected in a moist subtropical climate and standard samples of test cultures recommended for testing of technical products were taken as the objects of investigation. These investigations are practically beneficial in optimization of the methods of testing technical products for resistance to the effects of mold fungi. The relationships of the fungi were studied by the block method on a Czapek culture medium. Blocks 6 millimeters in diameter were cut from a column of the investigated culture or from material inoculated with the test culture after 30-day exposure. The blocks were placed on a background culture and the nature of relationships in each investigated version was determined after seven days of joint cultivation. Investigations of the relations of 17 species of test cultures from the standard set in combination of two species each on Czapek culture medium showed that the antagonistic properties are related to production of antibiotics whose activity is directly proportional to the resistance of the combined species to the antagonistic effect. Strains from six different materials being tested at the regime-climate station in the region of Batumi were isolated to determine the relationships of fungi in natural cenoses. The number of species on each material fluctuated from 4 to 7 with one-time sampling. The antibiotic properties of test culture were analyzed which permitted determination of their antagonistic relationships. The physiological state of strains of the selected test cultures must be monitored to optimize the methods of testing technical materials and specifically medical technology products. The antagonistic properties of the test cultures, their capability to acid-formation and enzymatic adaptation with respect to the tested substrate must be taken into account.

[308-6521]

UDC 617-001.45-085.849.19:615.849.1.015.25/-036.8

INFLUENCE OF THE COMBINED THERAPEUTIC USE OF A LASER AND CYSTAMINE ON HEALING OF GUNSHOT WOUNDS

Moscow KHIRURGIYA in Russian No 5, May 79 pp 84-86

RYAZHKIN, G. A., VLADIMIROV, V. G., AGEYEV, A. K., PEREGUDOV, I. G., SMIRNOV, A. D., TYURIN, V. G., KASHKOV, G. A., OZERETSKOVSKIY, L. B. and SHIPILOV, V. M., Department of General Surgery and Department of Pathological Anatomy, Military Academy imeni S. M. Kirov, Leningrad

[Abstract] Literature reports are cited of the favorable effect of laser radiation (U. Ya. Bogdanovich, et al, 1973, Mesler, et al, 1971, 1974) and, also, of certain pharmacological agents (Weber, H. G.) on the healing process of gunshot wounds. The present work was a test of wound therapy using the combined action of a laser, a local action, and the sulfur-containing cystamine, the effect of which is said to be at the tissue level and at the level of the integral body via the hypophysis-adrenal system. Two groups of 60 rabbits (subjected to gunshot wound of the soft tissue of the thigh), one group serving as control, were used in the test. The experimental group received intravenous cystamine, 100 mg/kg, daily for 7 consecutive days; the animal wounds were also irradiated with a low-power helium-neon laser, (an OKG-12), in a continuous mode, for 15 min, receiving a total of 1 joule, on an area just exceeding the wound size. The wound condition was studied over a period of 3 weeks. Tabulated results indicate that the wounds treated with the combined laser radiation and cystamine healed more rapidly than did the control group; earlier and more intensive formation of granulation tissue and more accelerated scar formation and epithelial tissue growth took place. References 6: 3 Russian, 1 German, 2 Hungarian.

[346-8586]

UDC 616-006.04(47 + 57)"1976"

THE INCIDENCE OF MALIGNANT NEOPLASMS IN THE POPULATION OF THE USSR IN 1976

Leningrad VOPROSY ONKOLOGII in Russian No 4, 1980 pp 10-43 manuscript received 19 Nov 79

NAPALKOV, N. P., TSERKOVNYY, G. F., MERABASHVILI, V. M., and PREOBRAZHENSKAYA, M. N.

[Abstract] A statistical survey of various aspects of the incidence of malignancies in the USSR for the year 1976 is presented, with consideration of male and female, urban and rural, and individual types of tumors throughout the country and in individual republics of the Soviet Union being covered by tables and graphs. In most republics, previous incidence per capita of particular malignancies continues with minor variations. Some decline in abdominal and cervical cancer was recorded, and

mortality decreased generally. At the same time breast cancer showed a sharp increase and took third place after abdominal and skin tumors among women. An alarming increase in lung cancer was also noted. As a result of better diagnosis, there was an increase in the number of cancer patients under treatment. Methods of treatment and facilities are discussed briefly. Figures 3; tables 16; references 18: 11 Russian, 7 Western.  
[343-12131]

UDC 616-006.04(47 + 57)

SPECIFIC FEATURES OF THE INCIDENCE OF MALIGNANT NEOPLASMS IN THE POPULATION OF THE USSR IN 1977

Leningrad VOPROSY ONKOLOGII in Russian No 4, 1980 pp 43-62 manuscript received 19 Nov 79

NAPAIKOV, N. P., TSERKOVNYY, G. F., MERABASHVILI, V. M., and PREOBRAZHENSKAYA, M. N.

[Abstract] Statistical data are interpreted to show trends and features of the incidence of malignancies in the USSR in 1977. The absolute number of diagnosed cases rose by 7819, or 1.6%, reaching 507,994. The incidence of particular types of cancer is summarized as a percentage of total cases and in terms of increase or decrease in the category. Lung cancer took first place among the male population, displacing abdominal cancer, while in women breast cancer showed a dramatic increase as the incidence of uterine cancer continued to decline. The incidence of malignancies per capita continues to be higher among rural populations than in cities, by 12.2 per 100,000 compared to 11.6 per 100,000. The number of patients under treatment and the duration of treatment combine with the reduction of posthumous diagnoses of malignancies to show improved diagnostic and treatment procedures. Increased mortality is attributed to the rising average age of the population. Figures 3; tables 15; references: 6 Russian.  
[343-12131]

UDC 613.155:725.51.056:613.161

THE CHEMICAL AND BACTERIAL POLLUTION OF HOSPITAL WARD AIR WITH VARIOUS TYPES OF AIR EXCHANGE

Moscow GIGIYENA I SANITARIYA in Russian No 1, Jan 80 pp 6-9 manuscript received 27 Dec 78

BOROVIK, E. B. and DMITRIYEV, M. T., Institute of General and Communal Hygiene imen' A. N. Sysin, USSR Academy of Medical Sciences, Moscow

[Abstract] Due to the wide variation in the rate of hospital air exchange the degree of air contamination was studied. At an air intake of 15-20  $\text{m}^3/\text{hr}$  per patient a large bacterial load was seen, with many pathogenic staphylococci and hemolytic streptococci. Air oxidizability, concentration of carbon monoxide, ammonia, phenol, styrol, formaldehyde, benzene and unsaturated hydrocarbons exceeded accepted limits. Quantitative expressions were derived for the amount of contamination in the presence and absence of ventilation, optimum specific air supply rate, the index of total contamination and the apparent index of contamination. The sources of air contamination in a hospital were found to be human respiration, polymeric structural materials, furniture, clothes, toys, disinfection and medical preparations, heating of food and human waste decomposition. The other sources were 4.8 times more significant than human respiration. The minimal air flow in a children's hospital was determined to be 80-90  $\text{m}^3/\text{hr}$  per patient for individual factors and 210  $\text{m}^3/\text{hr}$  per patient considering the combined action of all factors. Figures 2; references 10: 8 Russian, 2 Western.

[413-12126]

UDC 616.89-008.441.13-036.12-08.026.8

EFFICACY OF TREATING CHRONIC ALCOHOLISM FROM CATAMNESIS DATA

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 3, 1980 pp 55-56 manuscript received 8 Jan 79

LISKOVSKIY, O. V., SIROTNIKOV, B. Sh., SYKALO, V. I. and KHASIN, A. L., Republic Clinical Psychiatric Hospital

[Abstract] Selective catamnesis study of 301 patients who were treated in the specialized narcological department of the Republic Clinical Psychiatric Hospital during 1975-1977 was carried out. The catamnesis continued for 12-23 months. The efficacy of treatment (the length of abstinence from alcohol) was also studied as a function of the intensity of the acetylation processes which play an important role in alcohol metabolism. The patients were studied by a specially developed catamnestic chart in which the age, education, marital status, legal anamnesis, the presence of accompanying diseases, the frequency of admissions, the length of remissions, psychoses, causes of recidivism, the efficacy of various methods of

treatment and so on were reflected. The data were obtained by studying the history of the disease while examining the patients at home and from regional narcotics specialists. No statistically significant dependence of the length of remission on the maintenance therapy carried out, the frequency of admissions and the marital and legal status could be determined. The most effective methods of treatment were antabuse therapy and different types of psychotherapy. No statistically reliable differences in the distribution of fast and slow acetylating among abstainers and in the group which continued to abuse alcohol were determined.

[322-6521]

UDC 617-089+617-002-084

#### CONTINUING PROBLEMS WITH INFECTIONS IN HOSPITALS

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 10, Oct 79 pp 12-14 manuscript received 13 Feb 79

KHAMDAMOV, Kh. Kh., professor, and GAFFAROV, S. S., candidate of medical sciences, Clinic of General Surgery, Samarkand Medical Institute

[Abstract] Surgical infections were widely discussed at the 28th All-Union Congress of Surgeons, in 1965, and at the 24th Congress of the International Society of Surgeons, in 1971. An increase has been noted, in recent years, in postular postoperative complications (from 4 to 68%, according to data of various authors), more often of staphylococcal etiology (V. N. Struchkov, et al, 1973; V. A. Proskurov, 1974; Saik). The need for pre-operative preventive measures to sanitize the operational field and the hands of the surgeon is stressed. Examination of an appropriate procedure for use in the authors' clinic for 2 years is described. Three groups from a total of 485 patients were studied; the operational field in one group (105) was treated with iodine-alcohol tincture (5-10%); a second (112), with iodonate (1%); a third group (286) with degmin (1%). The latter group were broken down into a subgroup (112-critical operative interventions) who were given a single preparatory treatment and another (174) with a 3-minute treatment with degmin, three times over a 3-day period. Degmin is a derivative of hexamethylenetetramine and high molecular weight alcohols and is effective against gram-positive and gram-negative bacteria. The 1% degmin solution was also used to wash the surgeon's hands. Bacterial cultures from the treated skin of all groups showed that the 3-day treatment with degmin had a high antimicrobial effect; the degmin treatment is seen as more reliable preventive cleaning procedure and it promoted a decrease in frequency of wound infection in the postoperative period. No references.

[181-8586]

UDC 614.2.003.1

**DETERMINING COST EFFECTIVENESS OF SHORTENED TREATMENT PERIODS**

**MOSCOW SOVETSKOYE ZDRAVOKHRANENIYE** in Russian No 5, 1980 pp 25-29

**KULACINA, E. N., candidate of economic sciences**

**[Abstract]** A rationale is presented for the cost effectiveness of shortened treatment periods within the Soviet system, taking into consideration not only direct medical costs, but also the mean contribution of workers to the gross national income. From 1970 to 1977 the average daily productivity of a Soviet worker rose from 12.5 rubles to 25.5 rubles, sums which represent an economic loss when a worker is incapacitated by disease. Obviously, the cost effectiveness of treatment must be calculated on the basis of different criteria when dealing with patients who are not "working," e.g., children, retirees, housewives, etc. It is evident, then, that measures taken to improve therapeutic effectiveness which shorten the period of therapy and time away from work will do much to contribute to the overall success of the current Five Year Plan devoted to efficiency and quality in the Soviet economy.

[405-12172]

## ENVIRONMENTAL HAZARDS

UDC 577.152.199:615.849.1.015.25(048.8)

### SUPEROXIDE DISMUTASE: RADIobiological SIGNIFICANCE AND POSSIBILITIES (REVIEW)

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian No 3, 1980 manuscript received 22 May 79

GUSEV, V. A., BRUSOV, O. S. and PANCHENKO, L. F., All-Union Scientific Research Institute of Clinical and Experimental Surgery, USSR Ministry of Health, Moscow

[Abstract] Published work on research on free radical reactions in cells subjected to the effect of ionizing radiation was reviewed with particular attention to the role of superoxide dismutase. The importance of superoxide dismutase appears to lie in the fact that it renders harmless superoxide anion radicals by dismutation. The various sections of the article dealt with research on the biological role and physical and chemical properties of superoxide dismutase, the role of superoxide radicals in the oxygen effect, the role of superoxide dismutase in providing radio-resistance in microorganisms, and the radioprotective action of superoxide dismutase in mammals and man. It is concluded that this avenue of research has already made it possible to deepen theoretical ideas about the mechanism of the oxygen effect and the cause of variations in radiosensitivity in biological systems, and also the possible use of the enzyme in clinical practice as a radioprotective agent. References 77: 19 Russian, 58 Western.

[408-9642]

UDC 614.73:614.78]-07

### A COMPUTATIONAL METHOD FOR THE ASSESSMENT AND PREDICTION OF EXTERNAL GAMMA-IRRADIATION LEVELS FROM THE STANDPOINT OF HYGIENE

Moscow GIGIYENA I SANITARIYA in Russian No 2, 1980 pp 56-58 manuscript received 6 Mar 79

KARPOV, V. I., Leningrad Scientific Research Institute of Radiation Hygiene, RSFSR Ministry of Public Health

[Abstract] A method for estimating the mean annual equivalent dose of external irradiation of the population in per capita terms  $K$  (mrem/year) as well as the cumulative dose  $S$  on the basis of field measurements, calculations of gamma-irradiation doses in various types of buildings, and averaged data on street background, is presented. Corresponding formulas are given.  $K$  and  $S$  were plotted as a function

of time for certain of the nation's cities for 1978 and extrapolated until the year 2000. The characteristic  $R$  and  $S$  for a city with a population of 250,000 were found to be  $33.6 \text{ mrem/year}$  and  $7.8 \cdot 10^3 \text{ rem}$ , respectively. Considering that irradiation levels in brick buildings are higher than in wood and concrete buildings, a formula for the variation in mean annual irradiation dose as a function of the proportion of population dwelling in brick buildings is derived. Allowance is made for the Clark radioactivity of soils and the mean concentration of natural radionuclides in Soviet building materials. For the case of a high natural local gamma-background, the use of the presented formulas along with statistics on population distribution in buildings of various types (brick, concrete, wood) serves to obtain realistic estimates of the magnitude and dynamics of the dose load on the population due to the gamma-radiation of building materials. References 10: 5 Russian, 5 Western.  
[363-1386]

UDC 615.31:547.853].099

#### TOXICITY AND RADIOPROTECTIVE EFFECTS OF SOME 3,4,5,6-TETRAHYDROPRIMIDINE AND 3,6-DIHYDROPRIMIDINE DERIVATIVES

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian No 1, 1980 pp 103-107

IL'YUCHENOK, T. Yu., FRIGIDOV, L. M., SHADURSKIY, K. S., LEPEKHIN, V. P., IGNATOVA, L. A., and UNKOVSKIY, B. V., Radiation Pharmacology Laboratory, Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] Trials were conducted on outbred, 20-24 g, male mice to establish the toxicity levels and radioprotective properties of some derivatives of 3,4,5,6-tetrahydropyrimidine and 3,6-dihydropyrimidine. Evaluation of the resultant data demonstrated that the 4,6,6-trimethyl-3-alkyl(aryl)-2-methylthio-4-hydroxy-3,4,5,6-tetrahydropyrimidine hydroiodides were less toxic than the 4,6,6-trimethyl-3-alkyl(aryl)-2-methylthio-3,6-dihydropyrimidine hydroiodides. In addition, of the 16 compounds investigated only four provided moderate radioprotective effects (10-20% increased survival rate on exposure to 1000 Rad  $^{60}\text{Co}$ , 10 rad/min), while three derivatives actually acted as radiosensitizers. Tables 1; references 10: 4 Russian, 6 Western.  
[261-12172]

UDC 577.391:591.813

MODIFICATION OF THE CYTOGENIC EFFECT OF IRRADIATION BY THE COMBINED ACTION OF PROTECTORS AND INHIBITORS

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian Vol 32, No 10, Oct 79 pp 958-962  
manuscript received 18 Jul 79

AMIRBEKYAN, V. A., Institute of Experimental Biology, ArmSSR Academy of Sciences

[Abstract] The modifying effect of the classical radioprotecting agent -mercaptoethylamine (MEA) in combination with the normal DNA precursor - thymidine and the inhibitor caffeine has been studied in x-ray irradiation of wheat seeds. It was shown that a 3-hr incubation of irradiated seeds in a MEA solution resulted in a 12.9% decrease in chromosome aberrations (protective level 16.7%). A comparable protection was observed with thymidine and a MEA-caffeine combination. No protective effect was observed with caffeine alone or with MEA-thymidine combination. The mechanism of thiol protective action is based on inhibition of some metabolic steps, especially those connected with the synthesis of DNA. Data on the MEA effect obtained in this study support this observation. Overall, the results obtained showed that the use of MEA, thymidine and the combination MEA-caffeine, after irradiation, leads to significant decrease of chromosomal damage in wheat seeds. References 11: 9 Russian, 2 Western.  
[373-7813]

UDC 615.849.1.015.25.099

TOXICITY AND RADIOPROTECTIVE PROPERTIES OF 1,3-OXAZINE AND 1,3-THIAZINE DERIVATIVES

Moscow FARMAKOLOGIYA I TOKSICOLOGIYA in Russian No 6, 1979 manuscript received 28 Jul 78

IL'YUCHENOK, T. Yu., PRICIDOVA, L. M., SHADURSKIY, K. S., LEPEKHIN, V. P., IGNATOVA, L. A., UNKOVSKIY, B. V., Laboratory for Radiation Pharmacology (Professor T. Yu. Il'yuchenok, chief), Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] Eighteen 1,3-oxazine and 1,3-thiazine derivatives with varying levels of saturation were studied comparatively on 1,390 white mice to determine their toxicity and relative radioprotective properties. Administered to the animals in an aqueous, oil or emulsive solution, their radioprotective properties were investigated by administering them intraperitoneally in dosages of up to 1/2 the SD<sub>50</sub> 10 - 20 minutes prior to gamma radiation. Effectiveness was measured by the survival rate of the mice and the average life span of those sacrificed.

These compounds can be divided into two basic groups on the basis of their chemical structure. The first group (compounds I - IX) includes the 1,3-oxazine hydrohalogenides characterized by alkyl or aryl radicals at the second position in the amino group. In contrast, compound X has two double bonds in a ring. The second group

(compounds XI-XV) includes the 1,3-thiazine hydrochlorides which have radicals in the amino groups at the second position like the oxazines but which also have two double bonds in a ring. Compounds XVI and XVII are structural isomers of the 1,3-thiazines while compound XVIII is a unique thiazine derivative with a free amine which makes it somewhat less toxic. Of the oxazine derivatives, compounds I and VI which are hydrochlorides were found to be the most toxic. The hydrochloride thiazine derivatives compounds XII - XV were found to be of approximately equal toxicity with the exception of compound XI which was determined to be of approximately twice this level of toxicity. With the exception of compound XV, the 1,3-thiazine derivatives had a primarily depressant effect on the central nervous system while the 1,3-oxazines had a convulsive action. Compound X which protected 60% of the mice when given intraperitoneally in a dosage of 1/6SD<sub>16</sub> ten minutes prior to radiation showed the greatest radioprotective activity. Compounds V and SVI had a less pronounced radioprotective action while the others were ineffective. Monotypical regularity was noted in the variation of toxic properties as a function of chemical structure. Figures 2; references 9: 6 Russian, 3 Western. [189-900]

UDC 546.34.049:1.047

#### LITHIUM IN CENTRAL NERVOUS SYSTEM TISSUE IN RADIATION DISEASE

Moscow MEDITSINSKAYA RADILOGIYA in Russian No 1, 1980 pp 73-75 manuscript received 3 May 79

GRIVTSIV, B. A. and GOTSULYAK, L. Ye., Odessa Medical Institute imeni N. I. Pirogov

[Abstract] The effect of total body X-ray irradiation with a total dose of 0.12 Ci/kg (450 R) on various central nervous system [CNS] sections was studied in Chinchilla rabbits 2 and 6 hrs, 1,3,5,15 and 30 days after irradiation. The CNS sections differed significantly in their Li content: Levels were highest in the reticular formation followed by, in decreasing order, subcortical matter, cerebellum, cortex and spinal cord. Li levels fluctuated from 1 hr to 30 days after irradiation. Li levels increased immediately after irradiation in all tissues except the cerebellum; the highest levels were found in subcortical matter (after 2 hr, 15 and 30 days), cortex (6 hrs, 7 and 15 days) and reticular formation (15 and 30 days). Li levels dropped by 73.2% immediately after irradiation in the cerebellum, but were comparable to control from day 3 to 7 after irradiation. The considerable differences in the Li content in brain tissue are tissue-specific. References 12: 11 Russian, 1 Western. [234-0307]

UDC 612.419:576.858.095.383

INTERFERON PRODUCTION BY BONE MARROW CELLS TREATED WITH m-RNA FOR INTERFERON DURING THEIR TRANSPLANTATION TO IRRADIATED MICE

Moscow VOPROSY VIRUSOLOGII in Russian No 5, Sep/Oct 79 pp 541-544

ORLOVA, T. G., ZHDANOVA, L. V., MENTKEVICH, L. M., et al, Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] The goal of this study was to develop a model capable of in vivo production of interferon with the aid of m-RNA. Syngenic bone marrow cells were used as m-RNA protectors, the cells being transplanted to irradiated mice. CBA mice were used in the study. After irradiation with 800-850 R, they received bone marrow cells treated with RNA obtained from chick embryo cells at the 20th hour of induction with UV irradiated Newcastle disease virus. An interferon-like substance was obtained at reasonably high concentrations up to 6-8 days post transplantation; later, its output dropped considerably. This material inhibited the cytopathic effect of vesicular stomatitis virus in chick embryo cells but not in mouse L-cells. In contrast to cell culture systems, the m-RNA interferon functioned for a rather extended time period in the organism, making this the most optimal method for the adaptation of these cells to an organism. Figure 1; references 9: 3 Russian, 6 Western.

[103-7813]

UDC 616.5-001.29-085.357.453

COMPARATIVE EVALUATION OF THE EFFICACY OF OXYCORT OINTMENT AND PERUVIAN BALSAM IN TREATING RADIATION-INDUCED CUTANEOUS ULCERS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian No 1, 1980 pp 97-100

NIKULIN, A. A., and KRYLOVA, Ye. A., Chairs of Pharmacology and Radiology, Ryazan' Medical Institute imeni Academician I. P. Pavlov

[Abstract] Tests were conducted on the therapeutic efficacy of Oxcort ointment and Peruvian balsam in treating outbread albino rats with cutaneous ulcers appearing 13-15 days after exposure to 7000 R ionizing radiation from a RUM-7 therapeutic device. The resultant data demonstrated the superiority of Peruvian balsam in promoting skin healing and preventing bacterial infections, which markedly shortened the healing time (26-30 days vs. 60 days for untreated control animals). Animals treated with Oxcort ointment showed healing in 30-40 days. Peruvian balsam also promoted tissue respiration in the affected areas to several times the level observed with the ointment treated animals. Figures 3; references 13: 1 Western, 12 Russian.

[261-12172]

PROTECTIVE ACTION OF GENERAL GAS HYPOXIA IN LOCAL IRRADIATION OF THE SKIN OF BIG ANIMALS

Moscow MEDITSINSKAYA RADILOGIYA in Russian Vol 24, No 11, Nov 78 pp 3-8

KAMPRAD, F., ARNOLD, P., MEHLCHORN, G., JAHNS, J., KLICHE, R., VAYNSON, A. A. and YARMONENKO, S. P., Karl Marx University, Leipzig; Oncological Science Center, USSR Academy of Medical Sciences, Moscow

[Abstract] Yarmonenko had shown that normal animals--with well oxygenated tissues--which are put into a hypoxic state by breathing an oxygen-deficient gas mixture instead of normal air, can be made selectively more radioresistant. This finding had led to inquiry into potential improvement of radiation therapy of cancer by combining the radiation with induced hypoxia; in that inquiry--at the Oncological center in Moscow--mice had been used to show a relationship between the protective action of hypoxia (5-10% O<sub>2</sub> in the inspired gas mixture) and the related change in radiosensitivity at a definite partial pressure of O<sub>2</sub> in subcutaneous tissue. In the present work, done at the Leipzig school, the experiment was done on swine (Deutsches Landschwein) 2 mos old, 40-45 kg, and on dogs (beagle), 8-9 mos old. Prior to irradiation the animals were given a sedative, kambelen, and an immobilizer, polamidon. Gas mixtures inhaled contained N<sub>2</sub> and O<sub>2</sub>, 10 or 7.5% O<sub>2</sub>. A "Dermapan" 60 kV machine was used to irradiate the animals, single exposure, 1500-3000 rad for the swine, 2000-3500 rad for the dogs. Magnitude of the protective action was measured from the relationship of the radiation dose on the areas irradiated--with inspiration of air or the hypoxic mixture; conformity of the curves of accumulation and fall-off of the radiation effect with respect to time was seen. The 10% hypoxia decreased the severity of the radiation reaction in the swine and dogs. Lowering of the oxygen content to 7.5%, in the case of the dogs improved the protective action. The technique was used on human volunteers at the Oncological center; it was found that the 10% hypoxia level is protective with irradiation of normal tissue.

References 9: 7 Russian, 2 Western (by Yarmonenko, et al).

[182-8586]

UDC 617-001.28-085.356:577.164.14/:615.874.2

PROTECTIVE ACTION OF VITAMIN B<sub>5</sub> (PANTOTHENIC ACID) IN RADIATION SICKNESS ASSOCIATED WITH USE OF A MILK-EGG DIET

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 79 pp 25-28 manuscript received 19 Jul 78

YEGOROVA, N. D. and PEREPELKIN, S. R., First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] Perepelkin has reported earlier that a milk-egg diet had some favorable effects--as compared with other diets--in protection against the action of ionizing radiation. In the present work 1181 adult white male rats were exposed to total X-ray irradiation of 600 R (200 kV, current strength 15 mA, filters Cu 0.5 mm + Al 1.0 mm, skin-focus distance 56 cm, dose 21.2-22.4 R/min). The rats were being fed a first class, balanced milk-egg diet which provided 4.5 g protein per rat--animal protein 64%, 50% from milk, 14% from egg. The diet was modified by use of raw, or boiled, egg source. Protection of 76.8% is reported for rats which got raw eggs, 75.5% when the rats got boiled eggs. When B<sub>5</sub> was used to supplement the raw-egg diet only 48.2% of the rats survived; B<sub>5</sub> supplement with the boiled eggs yielded 85% survival. B<sub>5</sub> supplement was used in various doses 150, 750 and 1500 mg. The lower doses improved the leucocyte count. The milk-egg diet had a high protective action in the development stage of radiation disease. Comparatively large doses of B<sub>5</sub> apparently intensify the negative effect of avidin. References: 4 Russian. [555-8586]

UDC 614.73:061.3(47+57)"1978"

ON THE ALL-UNION CONFERENCE "LONG-TERM EFFECTS AND RISK EVALUATION IN RADIATION"

Moscow GIGIYENA I SANITARIYA in Russian No 1, Jan 80 pp 85-86

VASILENKO, I. Ya., professor

[Abstract] The All-Union Conference "Long-Term Effects and Risk Evaluation in Radiation" was held in Moscow, October 3-5, 1978. Reports concentrated on the biological effects of various radionuclides, particularly at low levels. New information on the hemopoietic organs, the cardiovascular system, respiratory and digestive organs, the neuroendocrine system, eight organs and the gonads was discussed. The blastomogenic and carcinogenic action of radiation, long-term results of radiation damage to glands and fetuses, <sup>14</sup>C and tritium effects in acute and chronic experiments, interaction of radiation damage with other factors and the application and extrapolation of experimental data from animals to humans were among the topics considered. Topics in need of further study are the naturally occurring and the transuranium radionuclides, pathogenesis, prevention and treatment of radiation damage, transmutation, microdosimetry, extrapolation of data from animals to humans and cancer epidemiology among humans exposed to radiation.

[413-12126]

UDC 616-001.28

RADIATION BURNS LOCATED ALONG THE TRAJECTORY OF MAJOR BLOOD VESSELS (EXPERIMENTAL STUDIES)

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, 1980 pp 24-27

SAYEVETS, N. V. and POVSTYANOY, N. Ye., Central Rayon Hospital, Cherbarkul'sk, Chelyabinsk Oblast, and the Kiev Scientific Research Institute of Hematology and Blood Transfusion

[Abstract] In order to determine optimum methods for treating radiation burns, experiments were conducted on male and female 8.5-20 kg dogs in which 3.5 x 5.0 cm (0.6-0.8 cm deep) ulceration was induced by exposure to 19,000 rads of x-rays in the inguinal region along the femoral artery. Following the course of the lesions demonstrated that rapid reconstructive surgery with removal of necrotic tissue facilitated a more favorable outcome and rapid healing. Ionizing radiation caused the greatest damage to, in succession, the skin and the subcutaneous fat, followed by the muscles, and then the connective tissues. The arterial wall was least susceptible to radiation damage. Early surgical intervention in such lesions appears to prevent generalization of dystrophic changes and arrosive blood loss. References 8: 1 Western, 7 Russian.

[294-12172]

UDC 613.27:/546.42.02.90+546.36.02:375

DIETARY FACTORS IN THE ACCUMULATION OF CESIUM-137 AND STRONTIUM-90 IN THE BODY

Kiev VRACHEBNOYE DELO in Russian No 2, 1980 pp 99-101

KORZUN, V. N., Chair of Nutrition Hygiene, Kiev Institute of Postgraduate Medicine

[Abstract] Investigations were conducted on the accumulation of Strontium-90 and Cesium-137 in mature female rats over a 500 day period in relation to various dietary factors. The radionuclides were administered daily ( $5 \times 10^{-7}$  Ci Ce-137 and  $1.5 \times 10^{-7}$  Ci Sr-90) with feed. The results showed that on high protein diets (18-40% of total calories) Ce-137 accumulation decreased by 32% after 500 days, and that of Sr-90 by 62% in comparison with control animal on standard laboratory chow. Addition of methionine (560 mg/rat/day) + calcium (256 mg/rat/day) decreased Sr-90 and Ce-137 accumulations by 68% and 52%, respectively. Addition of calcium alone (256 mg/rat/day) resulted in depression of Sr-90 accumulation only (by 64%). A high carbohydrate diet (potato) was ineffective in limiting the accumulation of these radionuclides, while addition of sodium alginate (400-800 mg/day) inhibited Sr-90 accumulation by 64-72% without affecting the Ce-137 levels. Over the 500 day period of observation the mortality figures ranged from 0% for rats on diet supplemented to insure an intake of 560 mg/day of methionine (15% for rats on 224 mg/day) to ca. 50%

for rats on the carbohydrate diet. Neoplastic changes were not detected in any of the methionine animals; 1-4 cases of neoplasia were found in rats on the other seven diet combinations out of the total of 330 experimental rats. Figures 4; references: 6 Russian.  
[247-12172]

UDC 613.645-07:612.014.44

#### HYGIENIC TESTING OF OPTICAL RADIATION

Moscow GIGIYENA I SANITARIYA in Russian No 2, 1980 pp 51-52 manuscript received 15 Jun 79

GVOZDENKO, I. A., SOKOLOV, M. V., PRIMAK, V. N., KUZINA, A. S. and SHISHKINA, N. S., Kiev, Institute of Hygiene of Labor and Occupational Diseases, UkrSSR Ministry of Public Health; Pushchino, Institute of Biological Physics, USSR Academy of Sciences

[Abstract] The broadening of the range of temperatures and sources of optical radiation (OR) used in industry and by consumers has resulted in a change in the intensities and spectral composition of that radiation, now that not only infrared but also visible and ultraviolet regions are used. In this connection, various instruments are used by hygienists to assess the danger of OR to human health--actinometers, pyranometers, photometers. The authors used a specially developed portable device equipped with a photometric attachment as well as a seven-position spectral attachment serving to measure the spectral distribution of OR within the 280-400 nm wavelength range, and used to determine the physical characteristics of the OR field present in welding operations. In addition, measurements in the IR region (up to 20  $\mu\text{m}$ ) were performed with the aid of a modernized LIOT actinometer. These experiments showed the efficiency of the available domestic and foreign OR-measuring instruments to be inadequate. It is necessary to set up interdisciplinary teams of hygienists, physiologists, biologists, biophysicists, and specialists in order to develop more precise instruments for determining the effect of OR doses on human health.

[363-1386]

UDC 612.35.014.22.014.44:621.375.826

## EFFECTS OF POWERFUL GAS LASERS ON THE SIZE OF HEPATOCYTIC NUCLEI

Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTAL'NAYA TERAPIYA in Russian No 2, 1980 pp 58-61

KALINTIN, Ye. V., Medical Institute imeni Academician I. P. Pavlov, Ryazan'

[Abstract] Studies were conducted on 100-120 g outbred rats to determine the effects of xenon (0.448, 0.568, 0.632 nm) and carbon dioxide (10.6 nm) gas lasers on hepatocytic nuclei as a manifestation of one component of general reactivity to such physical challenge. The hepatic changes were interpreted as indicating compensatory reactivity. Both types of lasers induced fluctuating changes in the size of the hepatocytic nuclei, with maxima 10 days after exposure to doses leading to skin lesions. Thereafter, rats exposed to carbon dioxide laser showed a more rapid decrease in nuclear size (average area in  $\mu\text{m}^2$ ) from +33.2% at day 10 to +18.1% on day 60 in comparison with control measurements, than seen in the rats exposed to the xenon laser (+29.0% on day 10, +29.0% on day 80). These results showed that karyometric studies may be used to follow regenerative changes induced by laser damage. Tables 2; figures 1; references 11: 1 Western, 10 Russian.

[416-12172]

UDC 616.5-006-085.849.19-091

## MORPHOLOGICAL CHANGES IN SKIN TUMORS CAUSED BY PULSED LASER IRRADIATION

Moscow ARKHIV PATOLOGII in Russian No 12, 1979 pp 12-17 manuscript received 26 Feb 79

MOSKALIK, K. G., LIPOVA, V. A. and NEYSHTADT, E. L., High Energy Laboratory, Pathomorphology Laboratory, Experimental Morphology and Cytology Laboratory, Scientific Research Institute of Oncology imeni N. N. Petrov, USSR Ministry of Health

[Abstract] Morphological changes induced by treating melanomas, basaloma and flat-cell skin cancers with a pulsed neodymium laser at 1060 nm, pulse length 1 msec and energy 250-500  $\text{J/cm}^2$ , were studied using impressions and scrapings from the affected area. Nuclear pyknosis, nuclear and cellular elongation, vacuolization, frequent complete loss of cytoplasm, particularly in the zone of direct irradiation, and loss of cellular structure were seen. These dystrophic changes increased with closeness to the zone of direct irradiation, culminating in necrosis. Formed and decomposed blood elements and melanin accumulated in the intracellular spaces, due to disruption of capillaries and small arteries and veins. Fewer and more aggregated melanoblasts were found after melanoma irradiation. Nuclear chromatin fusion, cytoplasmic changes and altered cell shape were observed. Basaloma cells were clustered

and elongated after irradiation, with many fibrous structures and loss of cellular elements. Cytoplasmic vacuolization and lysis, bare nuclei, karyolysis, karyorrhexis and karyopyknosis were seen in corneous flat-cell cancer. In the few cases in which malignant cells were found under the scab from the first treatment the procedure was repeated. The morphological changes induced by pulsed laser irradiation are very similar to electrocoagulation necrosis, but are more localized. The ability of low and middle energy lasers to induce thrombosis and coagulation in vascular walls reduces the probability of hematogenic tumor cell dissemination. Cytological examination is highly effective in determining the degree of radical skin cancer healing due to laser treatment. Figures 2; references 12: 9 Russian, 3 Western. [228-12,126]

UDC 615.917:547.532].015.4:616.411/419.003.93-02:615.849.19

EFFECT OF LASER RADIATION ON REPARATIVE PROCESSES IN THE HEMOCENIC SYSTEM OF RABBITS AFTER BENZENE POISONING

Moscow GIGIYENA TRUDA in Russian No 3, 1980 pp 9-13 manuscript received 27 Feb 79

SARKISYAN, A. P., and TEODOROVICH, B. P., The S. M. Kirov Institute for Advanced Medical Education, and the Institute of Blood Transfusions, Leningrad

[Abstract] Benzene was administered to 30 rabbits at a rate of 0.37 ml per kg of body weight on a daily basis, with the general dosage ranging from 8.12 to 21.3 ml. Doses were continued until the appearance of persistent leucopenia. Then a complete blood picture was prepared and histological material collected and evaluated. Of 18 rabbits who survived the benzene poisoning, 9 were treated with a helium-neon laser and the others used as controls. Results indicated that the laser treatment accelerated the regeneration of blood cells, particularly of the red part of hemogenic tissue. Figure 1; references 11: 9 Russian, 2 Western.  
[394-12131]

UDC 577.158:615.849.19:831.19

SPECTRAL CHARACTERISTICS OF BIOLOGICAL TISSUES FOR LASER THERAPY

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR (SPECTRAL CHARACTERISTICS OF BIOLOGICAL TISSUES) in Russian No 3, 1980 pp 73-76

PINCHUK, V. G., corresponding member of the UkrSSR Academy of Sciences,

ISAKOV, V. L., SHUKLINOV, V. A. and ISAKOVA, L. M., Institute of Oncology, UkrSSR Academy of Sciences

[Abstract] Spectral patterns and absorption coefficients were determined for guinea pig tissues (skeletal muscle, myocardium, kidney, spleen, lungs) in the ultraviolet and visible range, using 150 to 600  $\mu\text{m}$  thick sections. Comparison with the profiles obtained for blood and blood components showed that the tissue characteristic were largely determined by the presence of hemoglobin. The data can be utilized in planning rational laser therapy since the present findings indicate that greatest tissue penetration is obtained with 0.415  $\mu\text{m}$  wavelength. Table 1; figures 4; references 5: 1 Russian, 4 Western.  
[287-12172]

UDC 614.72-073:621.375.826

PROCEDURE FOR LASER HYGIENIC MONITORING OF THE ATMOSPHERIC AIR

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 79 pp 44-46 manuscript received 22 Sep 78

LIPOVSKIY, I. M., SVERDLOV, L. M., professor, and KOZLOV, V. N., professor, Saratov Polytechnic Institute

[Abstract] Study has been made of the interaction of a  $\text{CO}_2$ -laser radiation with molecular gases in order to determine the maximally recorded concentrations of a given gas. The gases studied, listed in tabular form, have been described by the USSR Ministry of Health as hygienically dangerous. The  $\text{CO}_2$ -laser was able to assay the concentration of any molecular gases which have an absorption range close to the frequency of the generation of the  $\text{CO}_2$ -laser ( $943 \text{ cm}^{-1}$ ) both remotely and in local volume. Fluorescence was observed with the gases tested. Sensitivity of the fluorescent method is higher the greater the magnitude of effective cross section of the interaction of the laser radiation with molecules of the substance. The method can be used to measure concentrations of toxic gases in working zones of industrial shops; attention must be given to potential extinction of fluorescence in specific cases. References: 2 Russian.  
[555-8586]

PRESENT-DAY STATUS AND PERSPECTIVES OF RESEARCH ON PREDICTION OF TOXIC PROPERTIES OF HARMFUL SUBSTANCES

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 79 pp 6-10 manuscript received 3 Jul 79

RUMYANTSEV, G. I., professor, and NOVIKOV, S. M., candidate of medical sciences, First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] The USSR's policy is to anticipate what prophylactic measures will be needed, and must be provided, to assure safe use of new chemical agents being introduced, in ever-increasing numbers, into the national economy. In the USSR, about 40 thousand compounds are synthesized yearly: 500 to 1000 of these are released to production. Their use must a priori not violate medical and biological standards. An important effort (Sanotskiy, Sidorenko, Pinigin) involves finding ways to predict toxicities, using short-term trials; this is coupled with the need to apply this toxicity information to setting approximate maximum permissible levels (MPL). The need for compounds in industry emphasizes the need for accelerated adoption of MPLs. Establishment of MPLs could use i) experience in use and standardization in other countries; ii) correlations between the MPLs of substances as established for various objects (e.g., reservoirs) in the environment; iii) patterns of associations between chemical structure, physical chemical properties and biological activity. Of these, i) is felt to be most promising, e.g., considerable data is already available in the US. Use of available information on the effect of a specific concentration of substance and time of its action can be helpful; data on analogous compounds can also be exploited, with some hope of success. Some encouragement is given to the OBUV standard "approximate safe level of action"-- In the last two years, the USSR has set such OBUVs for 100 air-pollutants and 68 industrially-harmful substances. References 21: 20 Russian, 1 Western.

[156-8586]

UDC 613.63-092.9-07

METHODS TO DETERMINE TENTATIVE SAFE LEVELS OF ACTION OF TOXIC SUBSTANCES BASED ON RESULTS OF ACUTE TESTS

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 79 pp 7-12 manuscript received 19 Oct 78

RUMYANTSEV, G. I., professor, and NOVIKOV, S. M., candidate of medical sciences, First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] An analysis is reported of the strength of the associations of the diverse parameters of toxicity of industrial poisons with the magnitude of the MPCs (maximum permissible concentrations) as a function of their aggregate state in air; also undertaken was a comparative evaluation of the accuracy of calculations based on earlier-suggested formulas. For this purpose a Minsk-32 was used for correlation and regression analysis of the parameters of toxicity of over 550 industrial poisons; parameters considered were average lethal doses, concentrations by oral, cutaneous and inhalation pathways of entry, threshold of acute action and coefficient of accumulation. Results showed that the strength of the associations between the parameters of toxicity of the poisons and the MPCs are, essentially, a function of the aggregate state of a substance in the air. A number of equations were derived of multiple regression to predict the tentative safe levels of action of new chemicals, taking into account their aggregate state and their toxicity under various routes of entry. Comparative evaluation of the accuracy of the use of these equations and of previously-employed equations point to greater reliability of the newly-derived equations of multiple regression. Accuracy and reliability of prediction of the tentative safe level of action of a new substance may be raised by taking into account the possible specific action of the new compound. References: 13 Russian. [555-8586]

UDC 612.017.1.014.45

IMMUNOLOGICAL REACTIVITY OF EXPERIMENTAL ANIMALS EXPOSED TO NOISE

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 79 pp 25-27 manuscript received 19 Mar 79

SHUBIK, V. M., doctor of medical sciences and NEGRIVENKO, K. V., Leningrad Scientific Research Institute of Radiation Hygiene; Leningrad Institute for the Advanced Training of Physicians

[Abstract] Male white rats were exposed to 65 dBA noise for 5 hours, 5 days for a week. Some of the animals were then killed and indices of natural immunity were assayed; another series immunized by i. . application of typhoid monovaccine enriched with Vi-antigen and, after 7, 14 and 21 days, their blood was assayed for

O- and Vi-antigens of typhoid vaccine. The control animals underwent parallel study but were not subjected to the noise. Exposure to the noise level proved to be undesirable in that it led to some depression of blood bactericidity, of complement activity and of antigen production. The noise led to strengthened formation of anti-tissue, complement-fixing auto-antibodies. References 7: 6 Russian, 1 Western. [156-8586]

UDC 614.72:628.521.53(470.57-25)

#### ON MEASURES TO FURTHER DECREASE AIR POLLUTION IN THE CITY OF UFA

Moscow GIGIYENA I SANITARIYA in Russian No 1, Jan 80 pp 60-62 manuscript received 15 Feb 79

OVSYANNIKOVA, L. B., Bashkir Medical Institute imeni Fifteenth Year of the All-Union Lenin Young Communist League, Ufa

[Abstract] In the 1960's the air of Ufa was heavily polluted with hydrocarbons, hydrogen, sulfide, sulfur dioxide and carbon monoxide. This pollution was reduced 2-7 times by measures taken in the reconstruction of the Ufimak petroleum refinery. Thirteen enterprises founded laboratories for control of atmospheric pollution. A yearly inspection-competition is conducted. During periods of unfavorable weather control observations are intensified, pouring operations are curtailed, gas or low-sulfur oil are used, reservoir compressors are started in petroleum plants, the refineries do not burn sludge residue and steaming of apparatus is forbidden. From 1975 to 1978 more than 300 gas-purifying and dust-collecting devices were constructed or reconstructed. In all refineries systems for collecting and compressing flame gases were reconstructed. More than 4 million tons of gas has been recovered in this way. Hermetic sealing of factory equipment and use of cyclone furnaces also contributed to the reduction of atmospheric hydrocarbons by 223 tons, sulfur dioxide by 47.9 tons and carbon monoxide by 85 tons. Detour, bypass and underground roads were built to limit auto pollution. These measures reduced atmospheric hydrocarbons by 30%, phenol by 17% and sulfur dioxide by 4%. [411-17126]

UDC 613.632.4:613.155.3

TENTATIVE SAFE EXPOSURE LEVEL AS AN INDICATOR OF SANITARY RESTRICTIONS ON THE CONTENT OF NOXIOUS SUBSTANCES IN THE AIR OF WORK PREMISES

Moscow GIGIYENA I SANITARIYA in Russian No 2, 1980 pp 72-74 manuscript received 11 May 79

TRAKHTENBERG, I. M. and KORSHUN, M. N.

[Abstract] The promulgation of the GOST [State Standard] 12.1.007-76 has made acute the need to settle the status of the so-called tentative safe exposure levels (TSEL) (rated maximum permissible levels) of noxious substances in the air of work premises. In this connection, the ways and means of establishing TSEL for various substances are considered. Thus, e.g., TSEL should apply to substances with varying degree of danger, toxicity, volatility, and biological effect. It is chiefly necessary to tighten the pertinent regulations and to broaden the range of noxious substances covered by TSEL. Such a step would be fundamentally justified yet also sufficiently cautious. More attention should in this connection be paid to substantiating the maximum permissible levels (MPL) of noxious substances in the air of work premises. By now there exist 900 norms governing the MPL of various substances in the air of work premises, along with research centers specializing in toxicologico-hygienic research into specific groups of chemical compounds: thus it is possible to make TSEL a significant and effective hygienic standard contributing to further refinement of modern sanitary supervision.

[363-1386]

UDC 351.778.31

NEW STATUTE GOVERNING THE STATE'S MONITORING OF WATER UTILIZATION AND CONSERVATION

Moscow GIGIYENA I SANITARIYA in Russian No 2, 1980 pp 3-6 manuscript received 22 Oct 79

ZARUBIN, G. P. and NOVIKOV, Yu. V., Moscow

[Abstract] The Statute of State Control Over Water Utilization and Conservation, as approved by the USSR Council of Ministers (SOBRANIYE POSTANOVLENIY PRAVITEL'-STVA SSSR No 17, 1979 p 366) names the agencies responsible for monitoring the utilization and conservation of waters throughout the USSR, especially those under the US. Ministry of Land Reclamation and Water Management, and specifies their functions. Among other things, these agencies decide on proposals for siting new enterprises and other facilities affecting the water usage, are responsible for issuing special water use permits with respect to the discharge of various liquid wastes, as well as irrigation permits, and consider water purification projects.

The concerned inspectors are authorized by the Statute to demand of any enterprise, organization, or institution, regardless of its administrative jurisdiction, that it take appropriate steps to improve its utilization and conservation of waters. The Statute further provides for penalties in cases of infraction of its regulations, as well as for coordinating the activities of various other ministries and organizations so far as water and conservation is concerned.

[361-1386]

UDC 614.777-078-71

#### DEVICE FOR SELECTION OF SILT SAMPLES FOR SANITARY-MICROBIOLOGICAL STUDIES

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 79 pp 52-53

MARAMOVICH, A. S., candidate of medical sciences, PINIGIN, A. F., NABIYEV, E. G., candidate of medical sciences, and RASPUTIN, A. M., Irkutsk Scientific Research Plague Control Institute of Siberia and the Far East

[Abstract] Retention of pathogenic organisms on reservoir bottoms and a natural recirculation of the organisms to the reservoir surface are discussed; finding in the seventeen of El Tor vibrios and other enterobacteria in the waters of open reservoirs has exacerbated the danger of infection from contaminated drinking water, attributable to possible storage in the bottom silt. Need for year-round sampling of the bottom silt is emphasized. This article reports construction of a silt sampler which provides acquisition of a silt sample from the reservoir bottom to a depth of 1-2 meters. It also provides for obtaining surface water layers. The device is pictured. The sample collected reaches the laboratory no later than 2 hrs after collection. Findings suggest that vibrio-type microorganisms apparently find more favorable survival conditions in reservoir silt. The device is recommended for use in monitoring programs of sanitary-epidemiological establishments. Figure 1; references 8: 7 Russian, 1 Western.

[555-8586]

## PHYSIOLOGY

UDC 577.1.612.119.014.46:612.398.145.4(047)

### CFU RESPONSE TO EXOGENOUS SOLUBLE AND IMMOBILIZED CYCLIC NUCLEOTIDES

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 250, No 1, 1980 pp 250-252

FEDOROV, N. A., KORESHKOVA, N. A., STEPANOVA, S. B., and GULYAYEV, N. N., Central Scientific Research Institute of Hematology and Blood Transfusion, Moscow, and the Moscow State University imeni M. V. Lomonosov

[Abstract] Female (CBA x C57Bl)F<sub>1</sub> mice were employed in a study designed to evaluate the efficacy of free and bound cyclic nucleotides in promoting proliferation of bone marrow colony forming units (CFU) in the spleens of lethally irradiated recipients. In experiments with free nucleotides the bone marrow cells were incubated with cAMP or cGMP prior to transplantation, whereas in studies on immobilized nucleotides cAMP bound to Sepharose 4B was employed. The resultant data indicated that free cAMP in physiologic concentrations markedly enhanced colony formation, while the low stimulation seen with cGMP may have been due to the fact that the normal concentration of cGMP in the bone marrow is much greater than that of cAMP to begin with. The effect of Sepharose 4B bound cAMP was ten-fold less than that with free cAMP, suggesting that the effects of exogenous cAMP are related to its ability to enter the cell. Table 1; references 5: 2 Russian, 3 Western.

[198-12172]

UDC 615.272.7.015.4:612.273.2

### EXPERIMENTAL STUDIES ON THE ANTIHYPOTIC EFFECTS OF RIBOKSIN

Moscow KHMIMO-FARMATSEVTICHESKIY ZHURNAL in Russian No 8, 1979 pp 69-73

KAPLAN, E. Ya., SOKOLOV, I. K., LOSEV, A. S., ASOYAN, G. A., KULAYEV, D. V., MAKSIKOVA, I. M., NOVOKSHONOV, A. I., CUKASOV, V. M., CHUSHEV, I. M., NURMAGOMAYEV, S. S., and SMIRYAGINA, V. I., Scientific Research Institute for Biological Testing of Chemicals, Moscow Oblast, and the Central Laboratory, 2nd Moscow Medical Institute imeni N. I. Pirogov

[Abstract] Several animal models and routes of administration were employed in studying the protective effects of riboksin (RK; Soviet inosine preparation) against acute and chronic forms of hypoxia. RK was found to be ineffective when administered to mice before or after acute hypoxia (exposure to "altitudes" of 6- or

10,000 m; 250 mg/kg intragastric), but intragastric (100-200 mg/kg) administration to rats prior to induction of renal ischemia prolonged the survival time and normalized plasma creatinine levels by the 7th day. Studies on dogs with extracorporeal circulation demonstrated the RK administered as an intravenous drip (40 mg/kg) favored normalization of the acid-base balance, visceral temperature, improved hemodynamic parameters and myocardial contractility. RK was thus shown to be therapeutically effective in gradual onset hypoxic states through mechanisms apparently involving ATP synthesis and inhibition of lipid peroxidation. Table 1; figures 3; references 13: 6 Russian, 7 Western.  
[551-12172]

UDC 591.104

#### THE MODES OF ACTION OF THE RECEPTOR TYPE PHYSIOLOGICALLY ACTIVE COMPOUNDS AND THEIR CLASSES STUDIED UNDER SCREENING CONDITIONS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 3, May/ Jun 80 pp 408-414 manuscript received 23 Jan 80

DMITRIYEVA, N. V., KAPLUN, A. B., and KOSOLAPOV, S. S., et al, Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna

[Abstract] One of the principal tasks in evaluating the physiologically active compounds (PAC) of the receptor type is the identification of their pharmacological activity and the analysis of cumulative effects. Normally this is done in comparison to standard compounds, which is not practical under conditions of massive compound screening. The functional multiparameter method (FMM) could be used to screen PAC, making it possible to identify the type of the effect and to estimate quantitative manifestation in a single experiment. The FMM is based on concurrent registry of electrophysiological determinants of live animals (male rats weighing  $200 \pm 10$  g) prior to and after administration of the test compound in a wide range of dosage. The dose-response approach has been proposed and found to be effective in screening receptor type PAC's. Figures 3; references 7: 6 Russian, 1 Western. [385-7813]

UDC 616.13-004.6-092.9-02:616.831.41-02:615.844

DEVELOPMENT OF ATHEROSCLEROSIS BY ALTERNATION OF PROLONGED ELECTROSTIMULATION OF NEGATIVE AND POSITIVE EMOTIogenic ZONES OF THE HYPOTHALAMUS

Moscow KARDIOLOGIYA in Russian No 3, 1980 submitted 27 Dec 78 signed to press 19 Feb 80, pp 104-108

KHOMULO, P. S., AMBROZAS, I. V., DMITRIYEVA, N. A., ZHAROVA, I. P., and NIKOLAYEV, V. I., Chair of Pathological Physiology (Head-Professor P. S. Khomulo) of the Leningrad Sanitation and Hygiene Medical Institute

[Abstract] Creation of transition states by alternation of electrostimulation of negative and positive emotiogenic zones of the hypothalamus and study of their effect on lipid metabolism, the state of the vascular wall and atherogenesis involved experiments on 86 rabbits of both sexes. Alternation of prolonged electrostimulation (10 days followed by 10 days of rest) created conditions for overstress of the emotions apparatus and impairment of adaptation mechanisms. Prolonged electrostimulation of negative emotiogenic zones (region of ventromedial nuclei) and subsequent rest caused disturbance of lipid metabolism impairment of permeability of the vascular wall and atherosclerosis which is amplified by alternation of electrostimulation of negative and positive emotiogenic zones and rest. Electrostimulation of positive emotiogenic zones (ventromedial nuclei) of the hypothalamus did not produce atherogenic changes in metabolism or production of atherosclerosis. References 20.

[397-2791]

UDC 612.44+612.58

QUANTITATIVE ANALYSIS OF THYROID SECRETION IN WHITE RATS ADAPTED TO COLD

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR in Russian Vol 63, No 11, 1977 pp 1589-1597 manuscript received 25 Jan 77

SONOLEV, V. I., Department of Human and Animal Physiology, State University, Donetsk

[Abstract] Quantitative analysis of the rate of thyroid secretion was examined by means of measuring doses of triiodothyronine necessary for normalization of a series of thermoregulatory reactions in 96 thyroidectomized white rats. Half of the animals were subjected to 12°C for 40 days and the other half to 24°C. Three series of experiments were conducted. In the first series at 30°, indicators of basic metabolism were compared with levels of calorigenic effect of noradrenaline. It was found that oxygen requirement in thyroidectomized rats was equal to that in intact rats only in those cases where the rats received 2.6 mcg/kg triiodothyronine

daily during cold adaptation. After injection of noradrenaline, 3.6 and 5.2 mcg/kg triiodothyronine per day were necessary for normalization. In the second series, a test in cold conditions was conducted. A dose of triiodothyronine necessary for normalization of rectal temperature was 7.4 mcg/kg per day; for body temperature, 6.6 mcg/kg per day. Rates of triiodothyronine were also estimated which would bring the thyroidectomized rats to the level of the control animals. In the third series, the doses of triiodothyronine necessary for normalization in cold after blocking of output of endogenic catecholamines were estimated. Also, the calorigenic effect of noradrenaline with cold and blocking of endogenic catecholamine output was examined. Overall the amount of triiodothyronine necessary for normalization was  $1.21 \pm 0.36$  mcg/kg at  $24^{\circ}\text{C}$  and  $6.04 \pm 0.76$  mcg/kg at  $12^{\circ}\text{C}$  for 40 days. Tables 3; diagrams 4; references 12: 5 Russian, 7 Western.  
[242-12,132]

HUMAN FACTORS

UDC 612.821-053.2-06:612.763

MOVEMENT FORCE CHARACTERISTICS IN WRITING AS CRITERIA FOR EVALUATING THE FUNCTIONAL STATE OF THE CNS

Moscow GIGIYENA I SANITARIYA in Russian No 1, Jan 80 pp 36-40 manuscript received 26 Mar 79

I.SITSYNA, K. A., Institute of Child and Youth Hygiene, USSR Ministry of Health, Moscow

[Abstract] Since writing involves complex interactions of the vertically and horizontally oriented nervous system, the pressure on the pen tip depends on the development of basic automation at various coordination levels. For this reason, criteria were developed for evaluating the functional state of the central nervous system according to the continuity and degree and character of pressure during writing. A ballpen was developed and constructed which records the force curve during writing. A computer was used to analyze 80 force curves from 22 6th grade students who were given dictation with identical beginning and end. It was found that at the end of the session the average interval of connected writing most often decreased, average pause length was unchanged, average force increased and average force modulation decreased. Force characteristics were more informative than time characteristics. The results indicate that during fatigue, inhibition of the cortical levels of motion coordination causes lower levels to be liberated from the control of the higher levels. References 18: 17 Russian, 1 Western.  
[413-12126]

ENGINEERING-PSYCHOLOGICAL DESIGN OF SYSTEMS FOR DISPLAYING INFORMATION

Moscow UPRAVLENIYE TEKHNICHEISKIMI I ORGANIZATSIONNYMI SISTEMAMI S PRIMENENIYEM VYCHISLITEL'NOY TEKHNIKI in Russian 1979, pp 38-42

GORSKIY, Ye. F. and YANUSHKIN, V. N.

[Abstract] This article appears in the source book [see Russian-language title above] "Control of Technical and Organizational Systems with the Use of Computer Technology." It defines the purpose of engineering-psychological design as improving the effectiveness of functioning of systems of production control and the effectiveness of organization of its central link, viz., the operator-technologist. It is, in essence, design of human activity. Its methodology employs psychology,

ergonomics, technical aesthetics, those disciplines which study the various aspects of human functioning in the production sphere. The authors' laboratory has been studying the structure of the mental activity of the operator in his resolution of operating tasks at the Sebryakovskiy Cement Plant. Considered in this article is one feature of control, control of systems of representation of information for operators of the central console of the Plants' system of automatic control and, specifically, the process for roasting of the clinker. The approach to study of the jobs and the conditions of the operator's activity is broken down into two parts, first a pre-design study and, second, the actual design of the working places and synthesis of information representation systems. The pre-design stage, consisted of a study of the facility to be controlled, analysis of the existing activity of the operators, a fundamental analysis of operators' activity and then setting forth the task involved in designing the working places and the systems for representation of information (at control consoles). Analysis was made of the general makeup of operator activity, e.g., at an oven, and of the activity of a console operator who is searching for information on the ongoing process. The second stage, design of systems of information representation, worked out basic tasks of i) correspondence of principles of construction of information presentation systems; ii) assurance of the opportunity for self-instruction of an operator and maintenance of the necessary level of this instructing capacity; iii) provision of an ongoing readiness of the operator to participate in the control process; iv) harmony of the ideology of the activity of the operator and of the principles for representation and codifying of information at various stages of control; v) a common system of coding at all consoles of the central post of control; and vi) topological adequacy of the means of representation and of the control units. Signals used for the panel designed are concretely exemplified. Participation of engineer-psychologists at all stages of design of the automatic control system of the Plant has been termed effective. No references.

[243-8586]

#### ASSESSMENT OF THE OCCUPATIONAL QUALITIES OF THE MAN-OPERATOR IN THE PROCESS OF A TEST DIALOG WITH A COMPUTER

Moscow UPRAVLENIYE TEKHNICHESKIMI I ORGANIZATSIONNYMI SISTEMAMI S PRIMENENIYEM VYCHISLITEL'NOY TEKHNIKI in Russian 1979 pp 97-102

SKHABYUK, V. Ye.

[Abstract] This is an article included in the Soviet text [Russian-language title above] "Control of Technical and Organizational Systems with the Use of Computer Technology." It suggests that the various available tests of human mental and physical qualities are inadequate to predict a potential for specific occupations; this shortcoming might be corrected if the examinee could be subjected to testing not only in static, laboratory conditions but, also, under conditions of execution of various occupational tests on tasks which model the future occupation and which require analogous capacities. The ultimate result of such a study would be construction of a psychophysiological portrait (PPP) of the subject; based on the

PPP it would be possible to assess his job readiness and to recommend appropriate preparation or improvement of essential occupational qualities. The PPP is seen as a multidimensional vector in a geometric space of partial criteria. A geometric interpretation of a PPP is constructed and pictured; taken into account are physiological parameters, memory capacity, attention parameters, results of work on selected specialized apparatus, motor capacities and parameters of a subject's analyzers. A revealed mental quality is to be studied with various tests and in various situations. An essential element for completion of forms and methods of test control is felt to be transfer of test procedures to a situation involving a dialog between the man subject and a digital computer. The latter simplifies processing and analysis of test responses and permits dynamic redirection of test emphasis and timing. The various qualities essential to specific jobs--technical skills, spatial conceptualization, abstract thinking, and, especially, mental response to routine, risk, the unexpected--are to be tested. A bloc-scheme is diagrammed for an automated system of psychophysiological testing; the computer used is the M-6000. Graphic display of findings utilized a UGD-43-1 display. No references.

[243-8586]

#### ADJUSTMENT OF COMPLEX SYSTEMS

Moscow UPRAVLENIYE TEKHNICHEKIMI I ORGANIZATSIONNYMI SISTEMAMI S PRIMENENIYEM VYCHISLITEL'NOY TEKHNIKI in Russian 1979 pp 42-48

GUCHUK, V. V.

[Abstract] This article appears in the source publication (see Russian-language title above) "Control of Technical and Organizational Systems with the Use of Computer Technology." The term, complex, adjustable system is given to that system, the index of quality of adjustment of which is a function of the adjustable parameters. Study of processes of adjustment warrant attention in view of the development of a new class of dialog, viz., man-machine systems of analysis of complex signals. Interest is expressed in an experimental study of adjustment, by a man-operator, of systems of formed figures with respect to various properties of the form of the illustrated figures; these properties are characteristic of dynamic spectrograms in the complex systems. In the experiments on an operator-computer system, the illustrations are formed (various shapes, graphs) by analog computers and the man-operator is expected to find the values of adjustable parameters which can achieve the appropriate adjustment of a figure. Treatment of the technique is essentially mathematical, cases being limited to a single adjustable parameter, or two parameters with one index of quality of adjustment. The adjustments can refine the ultimate figure and its informational character. References: 2 Russian.

[243-8586]

## PSYCHOLOGY

### A PSYCHOLOGICAL MODEL OF THE PROCESS OF SKILLS FORMATION

Moscow VOPROSY PSIKHOLOGII in Russian No 3, May/Jun 79 pp 56-665

GRANIK, G. G., Scientific Research Institute of General Pedagogic Psychology, USSR Academy of Psychological Sciences, Moscow

[Abstract] This article describes a model of the psychological mechanism of formation of skills based on learning of punctuation by elementary school students. Analysis of literature data and experimental data indicates that the formation of the structure of which a skill is composed occurs on the basis of preliminary mastery of a mental concept. This concept performs a unique psychological function, serving as a means of construction of the orientation portion of the action, related to the variety of conditions of its amplification. The author hypothesizes that the synthesis of the construction of this action lies at the basis of the psychological formation referred to as a skill. The series of experiments were performed to illustrate that school children develop a mental image of the general aspects of a skill, then apply this mental image to test and refine the particular manifestations under which the skill must be applied. References: 31 Russian.  
[195-6508]

### URBAN ENVIRONMENT AND HUMAN BEHAVIOR

Leningrad STROITEL'STVO I ARKHITEKTURA LENINGRADA in Russian No 3, 1980 pp 20-22

SHTEYNBAKH, Kh. E., psychologist

[Abstract] The effect of aesthetic surroundings on human psychology and behavior is considered. It is assumed that surroundings as related to past experience, condition specific styles of behavior. To verify this assumption, an experiment was carried out. By analogy with the thematic apperception test, the subjects were shown pictures of cityscapes and asked to describe their impressions of what was going on. Four cityscapes were shown: a former princely palace; an atypical well-built housing project; the courtyard of an old-style tenement building; and a standard housing project. The subjects were 52 students majoring in architecture and psychology. The essays written by the subjects served as the basis for isolating sensory units. Thus the category of behavior included pedestrian traffic, games by

children and teenagers, celebrations, deviant action (fights, drunkenness). The category of definition included esthetic appraisals such as "beautiful," "bright," "ugly," "filthy." The categories of subject and object of action included mention of age and social status of persons shown in the photograph, along with transportation and household animals. The category of negation pertained to expressions such as "here children cannot play." The category of time was included to estimate the frequency of mentions of the past and the future. The experiment was successful in the sense that it answered in a general way the question of how aspects of spatial and aesthetic solution of urban architecture affect human emotions and behavior. Further research is needed to determine optimal size of buildings and spaces and optimal amenities needed to create a functionally rich environment, a humanized architecture. Figures 4; references 9: 3 Western, 6 Russian.  
[368-1386]

#### A STUDY OF PERSONALITY CHARACTERISTICS OF PRESCHOOL AGE CHILDREN BY USE OF A "TEST-CONFLICT"

Moscow DEFEKTOLOGIYA in Russian No 6, 1979 pp 73-78

VOLKOVA, G. A., Leningrad State Institute imeni A. I. Gertzen and PANASYUK, A. Yu., Leningrad Pediatric Medicine Institute

[Abstract] A study of personality traits of 50 normal boys and 50 normal girls 5 years of age involved presentation of 30 "test-conflict" pictures to each child in a 30-minute session with recording of the intonation of response to each picture and evaluation of the difference in forms of reaction of the children to reveal their probable reactions to some real life situations. Most of the reactions of the children were negative involving impersonal or latent aggression but acknowledgement of guilt or an attempt to correct the situation was seldom expressed. Boys displayed more negative attitudes than girls, less frequently acknowledged their own fault and less frequently tried to master the situation. The data obtained were recommended for use in further detailed study of establishment of the relationship of children to their external world and as norms for comparative study of behavior of children with speech and mental disturbances in conflict situations. References: 15.  
[144-2791]

**METHODOLOGIC PROBLEMS IN AMERICAN DEVELOPMENTAL PSYCHOLOGY**

**Moscow VOPROSY PSIKHOLOGII in Russian No 3, May/Jun 79 pp 159-164**

**YEGOROVA, M. S., Scientific Research Institute of General and Pedagogic Psychology,  
USSR Academy of Psychological Sciences, Moscow**

**[Abstract]** Based on American sources referred to only by author and year, the author analyzes the capabilities of the longitudinal and cross-sectional methods of psychological testing for estimation of ontogenetic changes. The article leans heavily on a work by Schaie (1970), which suggests three methods of research, or three research strategies, all based on the measurement of the sequence of values of any two variables of three, i.e., the construction of three matrices of data--cohort-age, situation-age and situation-cohort. Depending on the strategy selected, the grouping of data changes, allowing more precise interpretation of the results produced and better founded conclusions concerning their nature.

[195-6508]

PSYCHIATRY

UDC 616-056.43-02:615.214-057:616.89-051

THE PROBLEM OF ALLERGIC REACTIONS AMONG THE EMPLOYEES OF A PSYCHIATRIC INSTITUTION

Moscow TERAPEVТИЧЕСКИЙ АРХИВ in Russian Vol 51, No 11, 1979 pp 90-94 manuscript received 8 Dec 78

DEMENT'YEVA, N. F., SIDORENKO, M. I., and GROMOVA, V. V., et al., Moscow Scientific-Research Institute of Psychiatry, RSFSR Public Health Ministry, Chair of Hospital Therapy, Faculty of Pediatrics, II Moscow Medical Institute imeni N. I. Pirogov

[Abstract] The health status of the workers being exposed to neuroleptic drugs was investigated. Two groups were studied--clinical workers who were directly exposed to these drugs, and laboratory technicians in clinical biochemistry and pathomorphology laboratories. The largest number of subjective complaints were coming from the pathomorphology and biochemical laboratories. However the first group had twice the number of diagnostic pathologies than the latter. The incidence of allergic skin manifestations increased with the duration of the exposure to neuroleptics. The most sensitive were workers in the 30-50 age group; 18 percent of the examined individuals showed sensitization to neuroleptics. It is very important to monitor the workers exposed to neuroleptic drugs by means of clinical and laboratory tests.

References 16: 8 Russian, 8 Western.

[265-7813]

UDC 616.89-053.2-02-07

EFFECT OF UNFAVORABLE FACTORS ON MENTAL HEALTH OF CHILDREN

Moscow ГИГИЕНА И САНИТАРИЯ in Russian No 2, 1980 pp 40-43 manuscript received 10 Apr 79

KANEN, V. V., SOLOMONOV, S. L. and IKAN, P. E., Riga Medical Institute

[Abstract] In the last few decades neuro-psychic pathology of children, whose origin is chiefly affected by exogenous and hereditary factors, has been increasing even though the overall state of health has improved. But while the effect of heredity on mental health of children is basically of a single type, the effect of exogenous factors displays more distinct regional differences. To investigate the various sociohygienic and medicobiological factors determining juvenile psychopathology (chiefly irreversible), the authors polled 1200 mothers of children born between 1960 and 1976 with schizophrenia (133 cases); borderline mental retardation

in the form of arrest of mental development (391); oligophrenia in the form of debility, imbecility, and idiocy (577); and Down's disease (99). This was accompanied by a control study of 616 mothers of mentally healthy children. The questionnaire consisted of 36 questions touching upon the sociodemographic, medicobiological, and sociohygienic aspects of life of the respondents. Statistical analysis of the replies revealed that 40.42% of parents and 25.5% of relatives of the children in the investigated group were mentally ill or had congenital defects or alcoholism compared with 7.9 and 17%, respectively in the control group). Factors unfavorably affecting the health of neonates (compared with control group) included acute gynecological illness of the mother and exacerbation of chronic extragenital diseases. Statistically reliable adverse factors during pregnancy included toxicosis, acute and chronic diseases, psychoemotional stress-largely due to husband's alcoholism, surgical intervention in pregnancy, smoking, drinking, drugs, heavy physical labor, and occupational poisoning. Among social factors, immoderate consumption of alcohol by mothers and/or fathers was particularly significant (10 times as frequent as in the control group). The effect of heredity was particularly marked in cases of schizophrenia. Thus a close relationship exists between the mental health of children and certain medico-biological and socio-hygienic factors which directly or indirectly affect the central nervous system. Figure 1; references 8: 6 Russian, 2 Western.

[363-1386]

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